

NASA SP-7043(16)  
January 1978

nautics and  
stration

**CASE FILE  
COPY**

y Energy Energy E  
rgy Energy Energ  
nergy Energy Enc  
y Energy Energy E  
rgy Energy Energ  
nergy Energy Enc  
y Energy Energy E

## ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

*IAA* (A-10000 Series)

A77-40471 – A77-51633

*STAR* (N-10000 Series)

N77-28060 – N77-34092

Previous publications announced in this series/subject category include:

<i>DOCUMENT</i>	<i>DATE</i>	<i>COVERAGE</i>
NASA SP-7042	April 1974	January 1968 – December 1973
NASA SP-7043(01)	May 1974	January 1, 1974 – March 31, 1974
NASA SP-7043(02)	November 1974	April 1, 1974 – June 30, 1974
NASA SP-7043(03)	February 1975	July 1, 1974 – September 30, 1974
NASA SP-7043(04)	May 1975	October 1, 1974 – December 31, 1974
NASA SP-7043(05)	August 1975	January 1, 1975 – March 31, 1975
NASA SP-7043(06)	October 1975	April 1, 1975 – June 30, 1975
NASA SP-7043(07)	December 1975	July 1, 1975 – September 30, 1975
NASA SP-7043(08)	February 1976	October 1, 1975 – December 31, 1975
NASA SP-7043(09)	April 1976	January 1, 1976 – March 31, 1976
NASA SP-7043(10)	July 1976	April 1, 1976 – June 30, 1976
NASA SP-7043(11)	October 1976	July 1, 1976 – September 30, 1976
NASA SP-7043(12)	January 1977	October 1, 1976 – December 31, 1976
NASA SP-7043(13)	April 1977	January 1, 1977 – March 31, 1977
NASA SP-7043(14)	July 1977	April 1, 1977 – June 30, 1977
NASA SP-7043(15)	October 1977	July 1, 1977 – September 30, 1977



# **ENERGY**

## **A Continuing Bibliography**

### **With Indexes**

#### **Issue 16**

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced from October 1 through December 31, 1977 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA)*



This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price code E05 (\$9 00 domestic, \$18 00 foreign)



# INTRODUCTION

This issue of *Energy A Continuing Bibliography with Indexes* (NASA SP-7043(16)) lists 1287 reports, journal articles, and other documents announced between October 1, 1977 and December 31, 1977 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of this continuing bibliography was published in May 1974 and succeeding issues are published quarterly.

The coverage includes regional, national and international energy systems; research and development on fuels and other sources of energy; energy conversion, transport, transmission, distribution and storage, with special emphasis on use of hydrogen and of solar energy. Also included are methods of locating or using new energy resources. Of special interest is energy for heating, lighting, for powering aircraft, surface vehicles, or other machinery.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries* in that order. The citation, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR* including the original accession numbers from the respective announcement journals. This procedure, which saves time and money accounts for the slight variation in citation appearances.

Five indexes -- subject, personal author, corporate source, contract number, and report number -- are included. The indexes are of the cumulating type throughout the year, with the fourth quarterly publication containing abstracts for the fourth quarter and index references for the four quarterly publications.

# AVAILABILITY OF CITED PUBLICATIONS

## IAA ENTRIES (A77-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service American Institute of Aeronautics and Astronautics, Inc (AIAA), as follows. Paper copies are available at \$6.00 per document up to a maximum of 20 pages. The charge for each additional page is 25 cents. Microfiche<sup>(1)</sup> are available at the rate of \$2.50 per microfiche for documents identified by the # symbol following the accession number. A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library. Minimum airmail postage to foreign countries is \$1.00. Please refer to the accession number, e.g., (A77-10121) when requesting publications.

## STAR ENTRIES (N77-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Price codes are given in the tables on page vii of the current issue of *STAR*.

Microfiche<sup>(1)</sup> is available regardless of age for those accessions followed by a # symbol.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Unit.

**NOTE ON ORDERING DOCUMENTS.** When ordering NASA publications (those followed by the \* symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$3.00 price, for those documents identified by a # symbol.)

Avail NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126) 600 Independence Ave. S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

(1) A microfiche is a transparent sheet of film 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).



- Avail. ERDA Depository Libraries** Organizations in U S cities and abroad that maintain collections of Energy Research and Development Administration reports, usually in microfiche form, are listed in *Nuclear Science Abstracts* Services available from the ERDA and its depositories are described in a booklet, *Science Information Available from the Energy Research and Development Administration* (TID-4550), which may be obtained without charge from the ERDA Technical Information Center
- Avail Univ Microfilms** Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm All requests should cite the author and the Order Number as they appear in the citation.
- Avail USGS** Originals of many reports from the U S Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction
- Avail HMSO** Publications of Her Majesty's Stationery Office are sold in the U S by Pendragon House, Inc (PHI), Redwood City, California The U S price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI
- Avail BLL (formerly NLL)** British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England Photocopies available from this organization at the price shown (If none is given, inquiry should be addressed to the BLL)
- Avail ZLDI.** Sold by the Zentralstelle für Luftfahrtokumentation und -Information, Munich, Federal Republic of Germany, at the price shown in deutschmarks (DM)
- Avail. Issuing Activity, or Corporate Author, or no indication of availability** Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.
- Avail: U.S Patent Office** Sold by Commissioner of Patents, U S Patent Office, at the standard price of 50 cents each, postage free
- Other availabilities** If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line

## **GENERAL AVAILABILITY**

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

## **SUBSCRIPTION AVAILABILITY**

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the quarterly supplements is \$45.00 domestic, \$75.00 foreign. All questions relating to the subscriptions should be referred to NTIS, Attn: Subscriptions, 5285 Port Royal Road, Springfield Virginia 22161.



## ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics  
and Astronautics  
Technical Information Service  
750 Third Ave  
New York, N Y 10017

British Library Lending Division,  
Boston Spa, Wetherby, Yorkshire,  
England

Commissioner of Patents  
U S Patent Office  
Washington, D C 20231

Energy Research and Development  
Administration  
Technical Information Center  
P O Box 62  
Oak Ridge, Tennessee 37830

ESA-Space Documentation Service  
ESRIN  
Via Galileo Galilei  
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office  
P O Box 569, S E 1  
London, England

NASA Scientific and Technical Information  
Facility  
P O Box 8757  
B W I Airport, Maryland 21240

National Aeronautics and Space  
Administration  
Scientific and Technical Information  
Office (NST-6)  
Washington, D C 20546

National Technical Information Service  
5285 Port Royal Road  
Springfield, Virginia 22161

Pendragon House, Inc  
899 Broadway Avenue  
Redwood City, California 94063

Superintendent of Documents  
U S Government Printing Office  
Washington, D C 20402

University Microfilms  
A Xerox Company  
300 North Zeeb Road  
Ann Arbor, Michigan 48106

University Microfilms, Ltd  
Tylers Green  
London, England

U S Geological Survey  
1033 General Services Administration  
Building  
Washington, D C 20242

U S Geological Survey  
601 E Cedar Avenue  
Flagstaff, Arizona 86002

U S Geological Survey  
345 Middlefield Road  
Menlo Park, California 94025

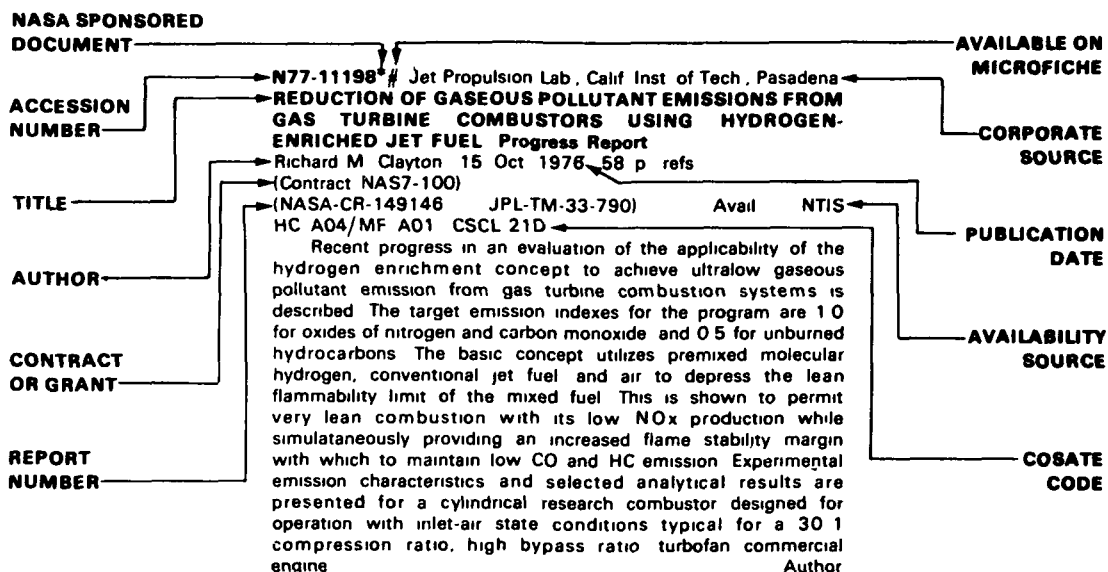
U S Geological Survey  
Bldg 25, Denver Federal Center  
Denver, Colorado 80225

Zentralstelle für Luftfahrt-doku-  
mentation und -Information  
8 München 86  
Postfach 880  
Federal Republic of Germany

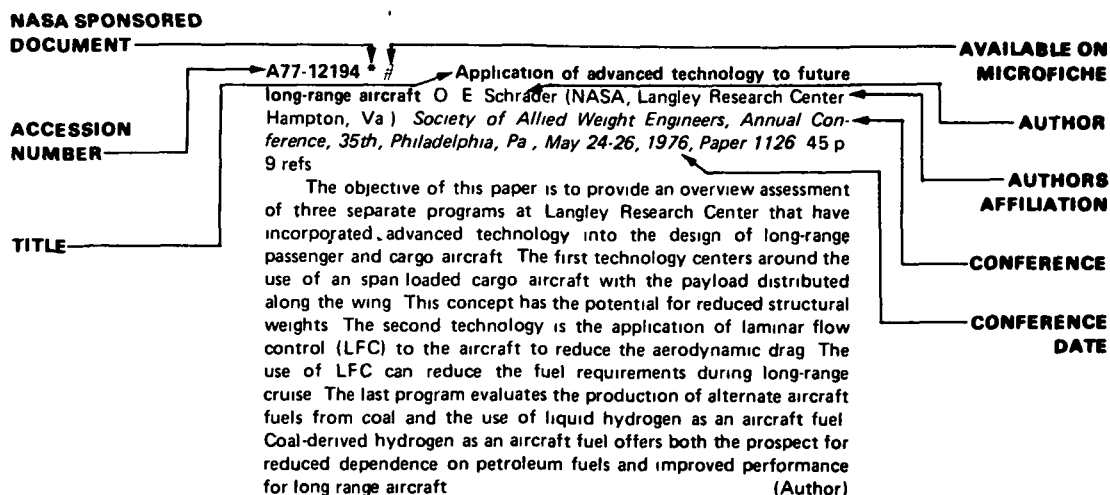
# TABLE OF CONTENTS

IAA Entries .....	399
STAR Entries .....	511
Subject Index .....	A-1
Personal Author Index .....	B-1
Corporate Source Index .....	C-1
Contract Number Index .....	D-1
Report/Accession Number Index .....	E-1

## TYPICAL CITATION AND ABSTRACT FROM STAR



## TYPICAL CITATION AND ABSTRACT FROM IAA





## **A Listing of Energy Bibliographies Contained In This Publication:**

1. An annotated bibliography, volume 1, appendix 2 p0513 N77-28577
2. An annotated bibliography, volume 2, appendix 2 p0513 N77-28578
3. Solar cells and solar panels p0529 N77-30621
4. Health effects of pollutants associated with fossil-fuel power generation An indexed bibliography with abstracts p0540 N77-31672
5. In-situ coal gasification: Status of technology and environment impact p0548 N77-32613
6. Reclamation of energy from solid waste: Theory and practice. A selected, annotated bibliography for Pennsylvania local government officials p0555 N77-33621

JANUARY 1978

### IAA ENTRIES

**A77-40512** Perspectives of geothermal energy in France (Perspectives de la géothermie en France). C Ruhla (Lyon I, Université, Lyons, France) *Sciences et Techniques*, June 1977, p. 22-28. In French

The feasibility of utilizing geothermal energy from low-grade (about 70 C) sources in France is considered. The geothermal flux in impermeable rock is calculated to be 0.0606 W/sq m, the ratio of the average geothermal flux to the average solar flux (1 16,500) is so low as to severely limit the development of this resource. Examination of a hypothetical reinjection system for tapping energy from the Dogger basin indicates that this source would be rapidly exhausted, renewal time is calculated to be 2000 years. However, theoretical analyses indicate that geothermal energy could be effectively used to heat private residences, in this capacity it has a major advantage over solar heat in that installation of geothermal heating systems does not necessitate radical modification of existing structures. The principals used in the analysis will be demonstrated in the Creil installation, in which geothermal energy will be used to heat 4000 residences. C K D

**A77-40519** Solar power in space - Energy for the year 2000. *Interavia*, vol 32, July 1977, p. 684-686

Solar energy, a clean and practically inexhaustible source of power, may become an increasingly attractive alternative to conventional sources as their costs rise. NASA's current studies of the economic and technical feasibility of space solar power emphasize development of a collector, 25 by 5 km, located in geosynchronous orbit at about 36,000 km above the earth. No atmospheric interference would occur at that position, and the collector could provide uninterrupted power to a given location on earth. Needed to implement this design are improved solar cells (silicon devices being the most promising candidates), research into problems of microwave transmission at high power levels, development of construction techniques in space; and availability of an orbital transfer vehicle and space shuttle systems with high payloads. Estimates of eventual costs at 30-115 mills (tens of thousandths of a cent) per kilowatt hour indicate that the concept is worthy of further investigation. J.M.B.

**A77-40523** # Problems in the use of oil shale as an energy source (Problemy energeticheskogo ispol'zovaniia goriuchikh slantsev). I. P. Epik. *Energetika*, vol 20, Apr. 1977, p. 54-61. 6 refs. In Russian

The paper discusses the development of oil shale exploitation and use in the USSR, some problems in connection with the operation of shale oil-burning steam generators, the problem of the emissions from a shale oil power plant, and the possibilities of further processing of shale oil combustion products for fertilizer and building material production. Soviet plans call for a reduction in the use of Baltic oil shale as an energy source in the years 1976-1980, but also for the development of an experimental facility in Estonia for shale oil processing in combination with oil processing for obtaining fertilizer and building material. P T H

**A77-40553** Photoelectrolysis with YFeO<sub>3</sub> electrodes. M A Butler, D S Ginley (Sandia Laboratories, Albuquerque, N Mex.), and M Eibschutz (Bell Telephone Laboratories, Inc., Murray Hill, N.J.) *Journal of Applied Physics*, vol 48, July 1977, p. 3070-3072. 13 refs. Contract No. AT(29-1)-789

The investigation is related to the possibility to use the photoelectrolysis of water with illuminated semiconducting electrodes as a means of solar energy conversion. Butler and Ginley (1977) have shown that a smaller electron affinity for the photoanode results in improved zero bias operation. The considered model predicts that the rare-earth orthoferrites should have improved zero bias operation characteristics over Fe<sub>2</sub>O<sub>3</sub>. A description is presented of studies which show that this is actually the case. The studies include the determination of the photoresponse of YFeO<sub>3</sub> anodes. The data indicate an indirect optical gap of 2.58 eV. It is found that the general behavior of YFeO<sub>3</sub> photoanodes is promising for the practical conversion of solar energy to chemical energy. G R

**A77-40567** CuInS<sub>2</sub> thin-film homojunction solar cells. L L Kazmerski and G A Sanborn (Maine, University, Orono, Me.) *Journal of Applied Physics*, vol 48, July 1977, p. 3178-3180. 17 refs. NSF-ERDA-supported research

The fabrication and characteristics of n,p-CuInS<sub>2</sub> thin film homojunction solar cells are presented. Dark and light I-V characteristics are reported for a 0.124 sq cm device with an efficiency of 3.33%, open circuit voltage of 0.41V, short circuiting current = 2.34 mA, and a fill factor of 0.43. A best efficiency of 3.62% is cited. An examination of the forward dark lnJ vs V characteristics indicates that the recombination-generation mechanism at the junction dominates the device operation. The spectral characteristics are presented and indicate a maximum near the wavelength (0.8 micron) corresponding to the energy gap of CuInS<sub>2</sub>, with a relatively low quantum efficiency (less than 0.45). The stability and limitations of this photovoltaic device are discussed. (Author)

**A77-40568** Upper limit of efficiency for photovoltaic solar cells. C. D. Mathers (Sydney, University, Sydney, Australia) *Journal of Applied Physics*, vol 48, July 1977, p. 3181, 3182. 7 refs.

A theoretical upper limit of efficiency is obtained for a photovoltaic solar cell which uses a semiconductor with a single energy gap. This limit is not based on a particular material or type of device and may be used with any solar or absorption spectrum. (Author)

**A77-40591** Threshold capabilities of a pulsed MHD converter for the production of electric power with a resistive load. E I Asinovskii and V E Ostashev (Akademiia Nauk SSSR, Nauchno-Issledovatel'skii Institut Vysokikh Temperatur, Moscow, USSR) (*Teplotfizika Vysokikh Temperatur*, vol 14, Sept-Oct 1976, p. 1079-1082.) *High Temperature*, vol 14, no 5, Mar 1977, p. 956-959. 6 refs. Translation

**A77-40644** Hydrogen peroxide emission levels from a hydrogen fueled combustion engine. K S Varde (Michigan, University, Dearborn, Mich.) and D K Lewis (Colgate University, Hamilton, N.Y.) *Air Pollution Control Association, Journal*, vol 27, July 1977, p. 678, 679. Research supported by the American Chemical Society and Sloan Foundation

**A77-40647** Solar thermal electricity - Power tower dominates research W D Metz *Science*, vol 197, July 22, 1977, p 353-356

The Energy Research and Development Administration (ERDA) has tended to favor development of centralized solar thermal generating plants at the expense of smaller scale intermediate-temperature systems, though, according to a report from the Office of Technology Assessment (OTA), the large solar electric plant, such as the 'power tower' presently being promoted by ERDA and the Electric Power Research Institute (EPRI), may not necessarily produce energy more efficiently than small on-site facilities. Features and costs of the heliostats being designed for the 'power tower' by various companies are compared. Subsidiary problems in developing the 'power tower', including design of the boiler, and construction of the tower itself are also discussed. J M B

**A77-40648 \*** Mining the Apollo and Amor asteroids B. O'Leary (Princeton University, Princeton, N.J.). *Science*, vol 197, July 22, 1977, p 363-366 42 refs Grant No. NSG-2062

Earth-approaching asteroids could provide raw materials for space manufacturing. For certain asteroids the total energy per unit mass for the transfer of asteroidal resources to a manufacturing site in high earth orbit is comparable to that for lunar materials. For logistical reasons the cost may be many times less. Optical studies suggest that these asteroids have compositions corresponding to those of carbonaceous and ordinary chondrites, with some containing large quantities of iron and nickel; other are thought to contain carbon, nitrogen, and hydrogen, elements that appear to be lacking on the moon. The prospect that several new candidate asteroids will be discovered over the next few years increases the likelihood that a variety of asteroidal resource materials can be retrieved on low-energy missions. (Author)

**A77-40673** Strategy of pollution control P M Berthouex and D F Rudd (Wisconsin University, Madison, Wis.) New York, John Wiley and Sons, Inc., 1977 585 p 36 refs \$18.95

The environmental system is examined and an analysis of material and energy flow is conducted, taking into account the hydrologic cycle, the preservation of water quality, nutrient cycles, population dynamics, the conservation of mass, material balancing with chemical transformation, the arithmetic equivalence of energy forms, the conversion equivalence of energy forms, the heat trap, the energy cost of fuel, energy and food, the production of industrial chemicals and materials, and energy and pollution control. Attention is also given to the strategic use of industrial chemistry, the processing with living organisms, separation systems, aspects of systems integration, and policy studies. G R

**A77-40682** Hydrocarbon deposits beyond the shelf edge of the oceans (Kohlenwasserstoffvorkommen jenseits der Schelfkante der Ozeane). W Schott (Bundesanstalt für Geowissenschaften und Rohstoffe, Hanover, West Germany) *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie*, vol 30, June 1977, p 251-256 56 refs In German

An investigation is conducted concerning the prospects for an occurrence of petroleum and natural gas deposits on the ocean floor beyond the continental shelf in the deep ocean regions, taking into account the geological characteristics of the ocean floor related to sediment formation. It is found that the geological structure of the continental margins is frequently affected by the geological conditions on the adjacent mainland. The presence of hydrocarbon deposits on the ocean floor beyond the edge of the 'Atlantic' continental shelves is, therefore, to be expected. Possibilities regarding an economic exploitation of the existing resources will depend on the magnitude of these resources and technological factors related to the development of suitable equipment. With respect to the 'Pacific' Ocean regions, the currently available information is not yet sufficient for predictions concerning the occurrence of hydrocarbon deposits in the involved areas. G R

**A77-40683** Energy forecasts yesterday and today (Energieprognosen gestern und heute) H Elfert (Esso AG, Hamburg, West Germany) *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie*, vol 30, June 1977, p 281-285 11 refs In German

Energy forecasts made in the past are considered, taking into account an investigation by Sandner (1972) who has found that during the time from 1955 to 1972 estimates regarding the growth of primary energy consumption were generally too low. Studies related to the availability of energy have become predominant since 1973. The problem of an evaluation of energy programs is investigated. Attention is also given to the limited reliability of the methods used in current energy forecasts, difficulties regarding a quantification of forecast data, and the consideration of alternative solutions in the study of energy supply problems. G R

**A77-40686** Electrochemical energy conversion II - Utilities, marine and space applications. F Hirschfeld *Mechanical Engineering*, vol 99, July 1977, p 28-34

Development and potential uses for some electrochemical cells are discussed. Stabilized zirconia, displaying good ionic conductivity at a temperature above 1200 K may be utilized for high temperature electrochemical processing in fuel cells and electrolysis cells, furthermore, when coupled with a low-temperature fuel cell, the zirconia battery can operate as an electrical generator. A planar bipolar cell stack and mixed conductors are suggested solutions for the design problems of high-temperature cells. The high-temperature zirconia cell and the high-temperature lithium-iron sulfide battery both have applications in electric utility load-leveling and in electric vehicle propulsion. A high-temperature lithium-inorganic cell, having a long operating life and capable of being pressure-equalized for deep ocean applications, is also considered. Improvements have been instituted in nickel-cadmium batteries, incorporating the superior gas recombination faculty of nickel-hydrogen systems, thus offering greater reliability and significant increase in cycle life capability. J M B.

**A77-40893** California's aqueduct offers peaking power to Los Angeles E Jeffs *Energy International*, vol 14, July 1977, p 17-19

The Castaic hydroelectric power project near Los Angeles, designed to recover energy expended in pumping water over the Tehachapi mountains, is described. The seven-unit plant makes use of water brought from Pyramid Lake (785 m above sea level) to Castaic Lake (462 m above sea level) by means of the 11.6 km Los Angeles tunnel. Pumped storage allows the plant to be used as a peak energy source in addition to operating as a spinning reserve without compromising the water supply. The machines are of the reversible Francis type. They are designed to operate as pumps under a dynamic head of 325 m on a rating of 238 MW, and under a 296 m head with a rating of 261 MW. The generator/motor units are of the modified umbrella type with a rating of 250 MVA. C K D.

**A77-41201 #** Explosion compression of plasma up to critical values of thermonuclear microfusion I, II S Kaliski (Polska Akademia Nauk, Instytut Podstawowych Problemow Techniki, Warsaw, Poland) *Journal of Technical Physics*, vol 18, no 1, 1977, p 3-16 13 refs

It is suggested that the critical parameters of thermonuclear microfusion can be obtained by a classical explosion method in a concentric compression system with a profiled explosion pulse converging at the center. The theoretical approach has been verified by experiments with a cylindrical system. Critical densities of D-T were obtained by an explosion procedure across a gas layer. The success of the explosion compression technique (and variants) is interpreted as making more feasible the production of thermonuclear microfusion by a combination of the explosion method with relatively weak sources of laser energy. M L

**A77-41211** Effects of coal mining on ground and surface water quality, Monongalia County, West Virginia. R G Corbett

(Akron, University, Akron, Ohio) (*American Association for the Advancement of Science, Symposium on Elemental Pathways from Rocks to Man, Boston, Mass Feb 1976*) *Science of the Total Environment*, vol 8, July 1977, p 21-38 19 refs Research supported by the U S Department of the Interior and University of Akron

**A77-41257** New developments on VW-PCI and VW-PCV stratified charge engine concepts (Über neuere Arbeiten am VW-PCI- und VW-PCV-Schichtladeverfahren) W Brandstetter *Motortechnische Zeitschrift*, vol 38, July-Aug 1977, p 327-330 17 refs In German Bundesministerium für Forschung und Technologie Contract No TV-7601-4

Two stratified charge engine concepts of the divided chamber type, namely the VW-PCI- (Pre-Chamber-Injection) and the VW-PCV-(Pre-Chamber-Valve) combustion process were developed and vehicle tested The main objective was to meet future exhaust emission standards while maintaining low fuel consumption Because of a number of advantages that were found for the PCI-process, such as lower NO(x) emissions for example, research efforts are concentrated in this direction In this paper, the influence of the degree of stratification is discussed Furthermore, the components for mixture formation and thermal exhaust aftertreatment are described (Author)

**A77-41258** The development of small regenerative gas turbines at MTU II (Die Entwicklung von Gasturbinen kleiner Leistung mit regenerativen Wärmetauschern in der MTU. II). W Heilmann and K Hagemeyer *Motortechnische Zeitschrift*, vol 38, July-Aug 1977, p 337-342 In German

In the first part of this contribution the design and construction principle of a gas turbine for commercial vehicle propulsion was described In the second part, the combined operation of drive unit is explained with reference to results from the test stand, concerning pressure and temperature distribution behind the turbine and before the regenerative heat exchanger, pressure losses and leakages in the whole system, and the temperatures of the bearings when the drive unit is being stopped Future developments with ceramic components are discussed (Author)

**A77-41316** Pyrolysis kinetics for oil-shale particles. B Granoff (Sandia Laboratories, Albuquerque, N Mex) and H E Nuttall, Jr (New Mexico, University, Albuquerque, N Mex) *Fuel*, vol 56, July 1977, p 234-240 13 refs ERDA-supported research

Experimental and mathematical investigations of the pyrolysis kinetics for single particles (12.7 mm diameter cylinders and spheres) of 22 gal/ton oil shale are presented Machined samples of uniform geometry were pyrolysed at 384-520 °C, while weight losses were continuously measured with a Cahn recording thermobalance Centerline temperature histories were obtained from samples instrumented with microthermocouples Other samples were partially pyrolysed, quenched, cross-sectioned and visually examined to aid in the understanding of the pyrolysis mechanism Two mathematical models were developed to represent the pyrolysis process A non-isothermal shrinking-core model was developed on the basis of observations of a shrinking-core mechanism in partially pyrolysed samples, an apparent pyrolysis activation energy of 110 kJ/mol was obtained A simplified, non-isothermal homogeneous model gave a pyrolysis activation energy of 148 kJ/mol It was shown that either model could account for the experimental centerline temperature histories and for the pyrolysis rates The non-isothermal homogeneous representation is considerably less complex than previously published pyrolysis models, and would be preferred for use as a subprogram in a comprehensive retorting model (Author)

**A77-41317** Coal particle integrity in high-temperature solvents, with and without agitation E G Plett, A C Alkidas, F E Rogers, and M Summerfield (Princeton University, Princeton, N J) *Fuel*, vol 56, July 1977, p 241-244 6 refs Research sponsored by the Mobil Research and Development Corp and Electric Power Research Institute

The physical characteristics of W Kentucky (bituminous) and Wyodak (subbituminous) coal particles after exposure to hydrogen-donor solvents at temperatures of 400-450 °C have been observed It is found that for exposures of up to 2 min, with pyridine extraction yields of up to 86% maf, particles do not disintegrate if no mechanical stresses are applied to them By contrast, with modest rates of stirring at 400 °C the particles do disintegrate at times as short as 2 min even with corresponding pyridine extraction yields of as low as 52% maf The mineral matter appears to comprise a major part of the physical skeletal structure which maintains particle integrity, in the absence of mechanical stresses, even after most of the organic matter has been removed (Author)

**A77-41318** Investigation into the use of large-scale total-energy systems in mild and warm climates F N Reale (Monash University, F N Reale and Associates, Clayton, Victoria, Australia) and T S Dillon (Monash University, Clayton, Victoria, Australia) *Fuel*, vol 56, July 1977, p 257-265 10 refs

An analysis of the economic feasibility of a large-scale (300 MW) total energy system, designed to provide energy for an idealized Australian city of about 100,000, is presented The system makes use of waste heat from coal-based electric power generation. An analysis of the heat energy requirements of a typical mix of industries indicates that about 35% of industrial heating load could be met by low-grade heat below 230 deg C Cost analyses show that it is possible to stage the development of a total-energy system so that capital outlays are distributed over an extended period of time Capital costs are found to be relatively insensitive to increases in demand for the first 15 years of development, however, sensitivity to this factor subsequently increases sharply, necessitating delay of decisions on final plant requirements until trends of industrialization and population growth are well established Efficiency of fuel utilization is climate-sensitive C K D

**A77-41319** Multi-stage activation of brown-coal chars with oxygen K Tomkow, T Siemienińska, A Jankowska, and F Czechowski (Wrocław, Politechnika, Wrocław, Poland) *Fuel*, vol 56, July 1977, p 266-270 11 refs

**A77-41321** Modelling of entrained-bed pulverized coal gasifiers S K Ubhayakar, D B Stickler, and R E Gannon (Avco Everett Research Laboratory, Inc., Everett, Mass) *Fuel*, vol 56, July 1977, p 281-291 28 refs Contract No EF-76-C-01-2015

An analytical model is formulated to describe the physical and chemical processes occurring in an entrained-bed pulverized coal gasifier The important processes considered are mixing of the cold coal-carrier-gas stream with the hot entraining gases, heat transport to the coal particles, the devolatilization of the coal particles to char and volatiles, the gas-phase reaction of these volatiles with the entraining gases and the thermal cracking of the volatiles outside the particles The solutions to the formulations are presented in the form of local properties as functions of particle residence time and inlet conditions Application of this model is exemplified by correlating it with the data obtained in an entrained-bed coal gasifier in which pulverized coal is injected into hot combustion gases to produce a fuel gas of low heating value (Author)

**A77-41351** The use of composite flywheels for braking energy recovery in road transport vehicles. R Bennison (Cambridge Consultants, Ltd., Cambridge, England) *Composites*, vol 8, July 1977, p 137, 138

An energy storage flywheel employing composite materials to improve vehicle acceleration and reduce energy requirements is described Differing ultimate tensile stress of a typical composite across and along the fibers necessitates a fiber-matrix arrangement that maximizes the energy-to-volume ratio while still providing convenience in wheel mounting, an elastomeric buffer between adjacent circumferential fiber layers is suggested to accommodate radial-expansion differences Fatigue properties of composites are found to be the limiting factor in setting the maximum rotational

speed of the wheel. To insure that the most fatigue-prone element of the composites, the resin matrix, does not destruct before the fiber layers under high stress, carbon fibers with a very low strain to failure rate are used. Other design problems include windage losses, which may be reduced by use of an evacuated chamber to enclose the assembly, the cost of protective housing, which may be minimized by engineering progressive instead of radical wheel failure.

J M B

**A77-41360 #** Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters (Fizicheskie printsipy preobrazovaniia energii kontsentrirrovannogo solnechnogo izlucheniia s 'pomoshch'iu poluprovodnikovykh fotopreobrazovatelei). N S Lidorenko, V M Evdokimov, A F Milovanov, and D S Strebkov. *Akademiia Nauk SSSR, Izvestiia, Energetika i Transport*, May-June 1977, p 110-115 5 refs. In Russian

**A77-41361 #** Heat transfer and resistance in rotating pipes /Review/ (Teploobmen i soprotivlenie vo vrashchaiushchikhsia trubakh /Obzor/). B. S. Petukhov and A. F. Poliakov. *Akademiia Nauk SSSR, Izvestiia, Energetika i Transport*, May-June 1977, p 116-133 33 refs. In Russian

The article addresses the current state of the art and future outlook for research on heat transfer and resistance to heat flow in rotating pipes, in relation to cooling of electrical power machinery. Available data are cited, possible data improvements are discussed, and prospective problems are considered. Data acquired as coolants with virtually constant physical properties (except for density, varying with inertial forces) flow through the pipes were considered.

R D V

**A77-41422** Energy resources available to man. S Curran (Strathclyde, University, Glasgow, Scotland). *Physics in Technology*, vol 8, July 1977, p 138-143

An overview is presented of options in energy utilization, efficiency in resources exploitation for energy, safety and liabilities, and public acceptance. The use of vast amounts of stored energy in industrial societies is pointed out, and contrasted to the stable ecosystem and highly efficient use of replenishable (solar) energy by the Tsembaga (New Guinea). Alternative energy sources are outlined (energy in waves, earth's interior, wind, solar energy). Fast breeders are viewed as inherently safer than conventional reactors because of their smaller cores, lower coolant pressure, and easier containment. Disposal of radioactive wastes is deemed a manageable problem, and the often-discussed fears of nuclear vandalism and terrorism are 'overrated.'

R.D.V.

**A77-41423** On strategies and fate. C. Marchetti (International Institute for Applied Systems Analysis, Laxenburg, Austria). *Physics in Technology*, vol. 8, July 1977, p. 157-162 7 refs.

Possible long-term stable trends in energy and resources utilization and in substitution of one energy source for another are examined as a guide and check on models and scenarios of energy resources management and planning. Long-term historical trends in per capita energy consumption, competing technologies in major industrial processes, extracting technologies associated with specific energy sources, long-term trends in fuel prices and power costs, and effects on the overall picture and on the world market of the introduction of new energy industries are considered, with graphical illustrations.

R D V.

**A77-41433** Analysis of the fill factor for n-CdS/p-CdTe solar cells. K W Mitchell, A L Fahrenbruch, and R H Bube (Stanford University, Stanford, Calif.) *Solid-State Electronics*, vol 20, July 1977, p 559-561 8 refs

**A77-41437** Sheet resistance component of series resistance in a solar cell as a function of grid geometry. N C Wyeth (Delaware, University, Newark, Del.) *Solid-State Electronics*, vol 20, July 1977, p 629-634 9 refs

Most photovoltaic solar cells use some type of light-transmitting grid electrode on the upper surface to reduce series resistance losses as the current is collected. The geometry of this grid is chosen through consideration of optical transparency and series resistance. A method of calculating the series resistance as a function of grid geometry is presented here with the following assumptions: (1) current generation is uniform over the area of the cell, (2) the thickness of the upper semiconductor layer is very much smaller than the lateral dimensions of the cell, (3) the resistance of the grid electrode is much less than the sheet resistance of the upper semiconductor layer, and (4) the current flow in the layer is ohmic. These assumptions will be satisfied for most solar cells of interest. The method is then applied to several representative grid geometries and the results are compared with previous calculations in the literature.

(Author)

**A77-41448** Gasification - Theory and application. K. Littlewood (Sheffield, University, Sheffield, England). *Progress in Energy and Combustion Science*, vol. 3, no 1, 1977, p. 35-71 119 refs

The chemical aspects of the gasification of coal are examined, taking into account stoichiometry, gas composition, and thermodynamic and kinetic data. The physical aspects of gasification are considered and a description is provided of the gasification processes. Attention is given to gaseous fuels of low caloric value, producer gas, water-gas reactions, methane synthesis reactions, fundamental reactions, the use of steam, the blast saturation temperature, blast furnace gas, and gaseous fuels of medium caloric value. Methods for the production of synthesis gas are also discussed and developments in the production of substitute natural gas from coal are explored.

G R.

**A77-41516** Photovoltaic energy conversion using concentrated sunlight. E. L. Burgess (Sandia Laboratories, Albuquerque, N. Mex.) *Optical Engineering*, vol 16, May-June 1977, p 305-312 12 refs. Contract No. E(29-1)-789

This paper describes a development program which uses sunlight-concentration techniques to effect an immediate reduction in cost per unit power for photovoltaic systems in which solar-cell cost dominates the total system cost. Current examples of concentrator solar-cell technologies are single-crystal silicon and gallium arsenide. Implementation of cost reductions by the use of sunlight concentration is not dependent on the development of low-cost mass-production cell technologies, but emphasizes high cell efficiency and low-cost concentrator systems.

(Author)

**A77-41551** New options in energy technology. *Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977*. Conference sponsored by the American Institute of Aeronautics and Astronautics, Edison Electric Institute, and Institute of Electrical and Electronics Engineers. New York, American Institute of Aeronautics and Astronautics, Inc., 1977. 152 p. Members, \$20., nonmembers, \$27 50.

The contributions comprise an overview of the present status and developmental outlook of nonconventional and prospective energy sources. Practical advances bringing commercial implementation nearer, and cost analysis, are emphasized. Satellite solar power, ground-based solar power, hydrogen energy storage, energy storage in compressed air reservoirs, thermal energy storage, MHD systems combined with combustion of fossil fuels (particularly coal), fuel cells, electrochemical storage batteries, laser-induced fusion, Tokamak and other fusion reactors, wind power, ocean thermal energy conversion, and improved energy management in fossil fuel (coal, petroleum) systems are discussed in papers dedicated to each of those topics. Nitrogen oxide emissions control and a high-temperature helium gas-cooled reactor combined with a closed-cycle gas turbine are also discussed.

R D V

**A77-41552 #** Energy management for commercial buildings and cooling storage. F. Dubin (Dubin-Bloom Associates-Consulting

Engineers, New York, N.Y.), A. Rosenfeld (California, University, Berkeley, Calif.), and T. Simonson (Simonson and Simonson-Consulting Engineers, San Francisco, Calif.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 1-3. 8 refs (AIAA 77-1004)

We estimate the feasibility and cost of installing chilled water storage in new buildings, so that electric chillers can be turned off during times of peak power demand. To replace a 100-ton chiller for 5 hours, the cost of thermal storage may be as low as \$250/ton, about half the cost of new gas turbines and distribution systems to supply the peak power. Cost of storage is presented as a function of chiller size. (Author)

**A77-41553 # Alternatives to oil and gas through energy management.** J. A. Belding (ERDA, Div. of Conservation Research and Technology, Washington, D.C.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 4-11. 12 refs (AIAA 77-1006)

The vital importance of improved energy production and reutilization management in helping to meet energy needs is discussed in relation to short-term candidates for replacing petroleum and natural gas: solar power, nuclear power, and coal. Electric power utilities, transportation, large industry, commercial/residential uses are covered in relation to the problem addressed. Energy management, energy efficiency enhancement, conservation cost/benefits, cost-time analysis, investment in conservation, waste heat utilization, and applications of advanced fuel cells in major power systems are dealt with. R D V

**A77-41554 # Storage batteries - The case and the candidates.** J. R. Birk (Electric Power Research Institute, Palo Alto, Calif.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977.

New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 12-16. (AIAA 77-1007)

The outlook for acceptance of batteries and improvements in batteries as sources of electric power for electrically actuated rail and municipal emergency power systems is assessed. Expected costs of various types of batteries (lead-acid, sodium-sulfur, sodium-antimony trichloride, lithium-metal sulfide, zinc-chlorine) as secondary power sources are discussed and compared with expected fuel costs. Present drawbacks of batteries are outlined (inadequate performance/operating life, high costs, repetitive cycling behavior, materials costs per kWh delivered). Battery applications in energy storage for various systems are considered. R D V

**A77-41555 # Compressed air energy storage.** K. G. Vossburgh (General Electric Co., Schenectady, N.Y.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 17-25. 14 refs (AIAA 77-1008)

Compressed air energy storage (CAES) systems are being developed for peak load leveling applications by electric utilities. Energy is stored by compressing air in an underground reservoir, when power is required, the air is heated and expanded through a turbine-generator system. Several CAES plants are being designed, and construction of the first large scale plant will be completed late this year. From the specifications of these systems, it is concluded that CAES systems appear to be economically favored over gas turbines and other near-term utility storage systems for a substantial range of costs of fuel and off-peak charging power. (Author)

**A77-41556 \* # Thermal storage for electric utilities.** C. J. Swet (ERDA, Washington, D.C.) and W. J. Masica (NASA, Lewis Research Center, Cleveland, Ohio) In New options in energy

technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 26-32. 17 refs (AIAA 77-1009)

Applications of the thermal energy storage (TES) principle (storage of sensible heat or latent heat, or heat storage in reversible chemical reactions) in power systems are evaluated. Load leveling behind the meter, load following at conventional thermal power plants, solar thermal power generation, and waste heat utilization are the principal TES applications considered. Specific TES examples discussed include storage heaters for electric-resistance space heating, air conditioning TES in the form of chilled water or eutectic salt baths, hot water TES, and trans-seasonal storage in heated water in confined aquifers. R D V

**A77-41557 # Utility views of MHD power generation.** C. H. Shih and M. K. Guha (American Electric Power Service Corp., New York, N.Y.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 33-40. 14 refs (AIAA 77-1010)

Economic and ecological advantages of developing an open-cycle MHD process for generating electric power from MHD combustion of coal, without the use of turbines, rotating generators, or other moving parts absorbing energy, are discussed and listed explicitly. Higher efficiencies, low cost of electric power generated, far more manageable pollution problems, 50% less warm water effluents, inertialess startup and shutdown, reduced maintenance costs, and ability to handle all grades of coal without pretreatment (except for moisture removal) are cited as salient advantages. Elevated temperatures and use of highly corrosive potassium salts are examined for possible environmental impact. R D V

**A77-41558 # Improvement in phosphoric acid cell power-plant technology.** L. M. Handley, P. E. Grevstad, and D. R. McVay (United Technologies Corp., Power Systems Div., South Windsor, Conn.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 41-50. (AIAA 77-1011)

An ERDA sponsored program has resulted in improvement in durability and cost of the phosphoric acid fuel cell power section and the fuel processor in a large, efficient first-generation electric utility powerplant. The program has served as a technology bridge between the 1.0-megawatt pilot plant tested at United's facility in early 1977 and the 4.8-megawatt demonstrator scheduled for delivery to a utility site in 1978. These powerplants are steps leading to commercial availability of the 27-megawatt FCG-1 for use in electric utility systems. (Author)

**A77-41559 # Economic assessment of the utilization of fuel cells in electric utility systems.** W. Wood, M. P. Bhavaraju, P. Yatchko (Public Service Electric and Gas Co., Newark, N.J.), and A. P. Fickett (Electric Power Research Institute, Palo Alto, Calif.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 51-61. (AIAA 77-1012)

The long range economic benefits of first generation and advanced fuel cells in the future generation capacity plans of a representative electric utility system are evaluated. The benefits of fuel cells' unique characteristics are separately quantified and the relationships between market penetration, fuel price, and capital cost are analyzed utilizing reliability, production cost, and optimum generation mix methods commonly used for generation planning in utilities. (Author)

**A77-41560 # Gas turbine HTGR - A total energy utilization option.** A. J. Goodjohn (General Atomic Co., San Diego, Calif.) and S. H. Law (Northeast Utilities Service Co., Hartford, Conn.) In New



options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 (A77-41551 19-44) New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 63-67 11 refs Research supported by the General Atomic Co., Contract No. EY-76-C-03-0167 (AIAA 77-1016)

This paper considers the High-Temperature Gas-Cooled Reactor (HTGR) using high-pressure helium as the working fluid and a power conversion system that uses a closed-cycle gas turbine coupled directly to an electrical generator. The primary cycle is capable of yielding thermal-to-electrical efficiencies of 40% or higher. The heat rejected from the system is at a sufficiently high temperature to be effectively utilized without incurring penalties to the basic efficiency of the primary cycle. Moreover, the HTGR, by virtue of its basic core design, can yield high fertile-to-fissile conversion ratios, irrespective of the chosen fuel cycle, and thus can play a very important role in reducing the consumption rate of uranium resources (Author)

**A77-41561 # Adapting the experience of DOD/Industry to developing fusion power reactors** W C Gough (Electric Power Research Institute, Palo Alto, Calif.) and W B Briggs (McDonnell Douglas Astronautics Co., St. Louis, Mo.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 69-75 (AIAA 77-1019)

Recent advances in controlled fusion research providing grounds for optimism are pointed out, and the program outlook for fusion power and management approaches to fusion reactor development are discussed. Contributions by the aerospace industry to fusion power development are discussed, comparisons between aerospace engineering design technology and needs of the fusion development program are cited (design to cost, scheduling and program milestones, simultaneous attention to basic physics, engineering design, cost, and performance) R D V

**A77-41562 # Integration of solar generation into electric utility systems** J W Ballance (Southern California Edison Co., Rosemead, Calif.) and G W Braun (ERDA, Washington, D.C.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 76-83 (AIAA 77-1020)

The value of solar thermal power plants to an electric utility system has been determined. The relationship between solar power plant values and solar thermal storage levels, mix of other resources, and the level of solar generation in the system are described. The operating characteristics of solar generation are discussed, and strategies for optimizing the value of solar generation are described. Current maximum cost levels (in dollars) for solar generation are presented, and target levels for component costs are discussed (Author)

**A77-41563 \* # Silicon solar photovoltaic power stations.** C R Chowaniec (Westinghouse Electric Corp., East Pittsburgh, Pa.), R R Ferber (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif., Westinghouse Electric Corp., East Pittsburgh, Pa.), P F Pittman (Westinghouse Electric Corp., Pittsburgh, Pa.), and B W Marshall (Sandia Laboratories, Albuquerque, N. Mex.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 84-89 (AIAA 77-1021)

Modular design of components and arrays, cost estimates for modules and support structures, and cost/performance analysis of a central solar photovoltaic power plant are discussed. Costs of collector/reflector arrays are judged the dominant element in the total capital investment. High-concentration solar tracking arrays are recommended as the most economic means for producing solar photovoltaic energy when solar cells costs are high (\$500 per kW generated). Capital costs for power conditioning subsystem compo-

nents are itemized and system busbar energy costs are discussed at length R D V

**A77-41564 # Perspectives on implementing OTEC power.** D. G. Jopling (Florida Power and Light Co., Miami, Fla.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 90-96 (AIAA 77-1024)

Major problems confronting the development and commercialization of ocean thermal energy conversion (OTEC) are discussed, along with OTEC feasibility. The need for large extended heat exchangers and the high cost of such exchangers is focused on as a major problem, along with problems of corrosion and marine microbiofouling of the heat exchanger and other system equipment. Open or closed cycles, anchoring or sea surface grazing, component construction and assembly on the high seas, mooring during setup, and mechanical stresses at anchorage or en route to location are discussed. Advanced turbine and pump designs, bottoming cycles, new construction materials and techniques, and new heat transfer fluids and heat exchangers designs are envisaged as likely technological spinoffs from OTEC R D V

**A77-41565 # Implementation issues of wind energy.** U. Coty and L. Vaughn (Lockheed-California Co., Burbank, Calif.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 97-105 (AIAA 77-1025)

Initial production quantities required by users (including developing nations), competitive energy cost criteria, and energy cost fractions are tabulated and compared. Availability of alternative energy sources, availability of incentives (financing by government or foreign loans), and availability of suitable high-wind sites are taken into account. Minimum investments and commitments to purchases of wind turbine generators to implement a wind power development program on a commercial are estimated R D V

**A77-41566 # Transmission of power from space to earth.** W. C. Brown (Raytheon Co., Lexington, Mass.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 106-116 24 refs (AIAA 77-1026)

The transfer of energy from synchronous orbit to earth is accomplished by means of microwave power transmission. Microwave power transmission is a three-step process consisting of generation of microwave power from DC power, the formation of a highly collimated beam of microwaves for transmitting the power, and the capture and rectification of power at the earth end of the system. The technology fulfills the basic requirements for an efficient, reliable and safe system with power handling capability in the 5 - 10 GW region. The projected DC to DC system efficiency is 60%. A frequency in the 2 - 3 GHz region permits efficient power transfer through the earth's atmosphere. The devices used for energy conversion are described and their integration into a full scale system is discussed (Author)

**A77-41567 \* # Satellite solar power - Will it pay off.** G. A. Hazelrigg, Jr. (ECON, Inc., Princeton, N.J.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p. 117-123 10 refs NASA-supported research (AIAA 77-1027)

A cost analysis is presented for front-end investments required for the development of a satellite solar power system. The methodology used makes use of risk analysis techniques to quantify the present state of knowledge relevant to the construction and operation of a satellite solar power station 20 years in the future. Results are used to evaluate the 'expected value' of a three-year

research program providing additional information which will be used as a basis for a decision to either continue development of the concept at an increasing funding level or to terminate or drastically alter the program. The program is costed phase by phase, and a decision tree is constructed. The estimated probability of success for the research and studies phase is 540. The expected value of a program leading to the construction of 120 systems at a rate of four per year is 12 433 billion dollars. C K D

**A77-41569 # Hydrogen by electrolysis to supplement pipeline gas supplies - Technical and economic aspects.** C R Guerra and W S Ku (Public Service Electric and Gas Co., Newark, N.J.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York: American Institute of Aeronautics and Astronautics, Inc., 1977, p. 133-139. ERDA-sponsored research (AIAA 77-1032)

**A77-41570 # Hydrogen-via-Electricity - A candidate transitional transportation energy system concept.** E E Ecklund (ERDA, Washington, D.C.) and W J D Escher (ERDA, Washington, D.C., Escher Technology Associates, St. Johns, Mich.) In New options in energy technology, Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977. New York: American Institute of Aeronautics and Astronautics, Inc., 1977, p. 140-149. 19 refs (AIAA 77-1034)

Available approaches to creation of a non-petroleum energy base for transportation all involve long-term, costly systems, each having technical and socio-economic limitations and constraints which will govern its eventual contribution. To preserve all options, yet take positive steps to obviate serious transportation energy shortfalls, transitional steps must be implemented beginning in the relatively near-term. The Hydrogen-via-Electricity (HVE) concept has been proposed as one candidate transitional system. This system utilizes the in-place electrical utility energy delivery systems to produce hydrogen energy via water electrolysis at selected vehicular fueling points. Vehicles converted to operate on hydrogen could be operated indirectly on coal and primarily on nuclear energy. The HVE concept has relatively near-term potential for supporting a certain fraction of such critical transportation modes as railroads, intercity trucking, buses and fleet vehicles of various kinds. Environmental benefits will also accrue. (Author)

**A77-41571 \* # The NASA Energy Conservation Program.** G P Gaffney (NASA, Office of Facilities, Washington, D.C.) AIAA, EEl, and IEEE, Conference on New Options in Energy Technology, San Francisco, Calif., Aug. 2-4, 1977, AIAA Paper 77-1005 3 p

Large energy-intensive research and test equipment at NASA installations is identified, and methods for reducing energy consumption outlined. However, some of the research facilities are involved in developing more efficient, fuel-conserving aircraft, and tradeoffs between immediate and long-term conservation may be necessary. Major programs for conservation include computer-based systems to automatically monitor and control utility consumption, a steam-producing solid waste incinerator, and a computer-based cost analysis technique to engineer more efficient heating and cooling of buildings. Alternate energy sources in operation or under evaluation include solar collectors, electric vehicles, and ultrasonically emulsified fuel to attain higher combustion efficiency. Management support, cooperative participation by employees, and effective reporting systems for conservation programs, are also discussed. J M B

**A77-41576 The atypical Mathew solar house at Coos Bay, Oregon.** J S Reynolds, M S Baker, R L Gray (Oregon, University, Eugene, Ore.), M B Larson (Oregon State University, Corvallis, Ore.), and H. Mathew (International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug. 1, 1975) Solar Energy, vol 19, no 3, 1977, p. 219-232

The effectiveness of an atypical solar energy system in meeting space heating needs in the Mathew house in Coos Bay, Oregon is

analyzed in detail. Unusual features of this system include its location, which is cloudy in winter, its use of near-vertical collectors together with a near-horizontal reflector, its 8000 gal storage tank, its combination of a rooftop collector (400 sq ft) with a freestanding ground collector (325 sq ft) of almost identical design. The house heat loss is calculated and heat contributed by electricity, direct solar gain through windows, and metabolism is subtracted to obtain the assumed solar energy. The stored solar energy utilized is obtained by adjusting the measured energy provided by the collectors for energy withdrawn or contributed to storage during each month and for losses to ground. The space heating requirement for the house is calculated to be 14,802 kWh, of which 85% is provided by the solar energy system. Measured solar collector/storage tank contributions are in close agreement with those assumed from heat loss calculations over the 8-month heating season. Wide variations in some months can be partially accounted for by uncertainties in measurements and further indicate energy storage in the earth facing the reflector. C K D

**A77-41577 Use of adsorbent beds for energy storage in drying of heating systems.** D J Close (North Queensland, James Cook University, Townsville, Australia) and R V Dunkle (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Victoria, Australia) Solar Energy, vol 19, no 3, 1977, p. 233-238. 11 refs

Energy storage is an important feature of many solar energy systems. Because of the small temperature potentials available from flat plate collectors, large masses and volumes are involved when energy is stored by raising or lowering the temperature of a tank of fluid or bed of gravel. This paper proposes energy storage in the form of heat of adsorption in beds of adsorbent material. This is most readily achieved by nominating water as the adsorbate so that water vapour is transferred to or from the adsorbent from the humid air flowing through the bed. The large heat of adsorption means that the adsorption of a small mass of water liberates a large amount of energy which mostly is transferred to the air stream. It is shown that adsorbing materials can occupy a much smaller volume than non-adsorbing materials for the same quantity of energy stored, and that thermal insulation can be dispensed with. Provided that the container is impervious to water vapour, energy can be stored indefinitely. (Author)

**A77-41578 A solar flux density calculation for a solar tower concentrator using a two-dimensional Hermite function expansion.** M D Walzel, F W Lipps, and L L Vant-Hull (Houston, University, Houston, Tex.) (International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug. 1, 1975) Solar Energy, vol 19, no 3, 1977, p. 239-253. 8 refs. NSF Grant No. GI-39456

The calculation of flux density on the central receiver due to a large number of flat polygonal reflectors having various orientations is a basic part of the system simulation problem for the tower concept of solar energy collection. A two-dimensional Hermite function expansion is adapted to the simulation problem, and numerical results are contrasted with an analytic integration of the solar flux density at specific nodes on an image plane. Various measures of error in the flux density calculation are monitored vs distance to the image plane and orientation of the reflector. The flux densities predicted by the statistical method compare favorably with those of the analytic model and require approximately one-tenth the computer time. (Author)

**A77-41579 Cost studies on terrestrial photovoltaic power systems with sunlight concentration.** D L Evans and L W Florschuetz (Arizona State University, Tempe, Ariz.) (International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug. 1, 1975) Solar Energy, vol 19, no 3, 1977, p. 255-262. 6 refs. NSF Grant No. GI-41894, Contract No. E(11-1)-2590

A systems simulation program for comparing the energy costs associated with various alternative concentrating photovoltaic solar

systems to energy costs expected with flat arrays is described. The application to linear focus and point focus concentrators is presented in a parameterized way. The results show that concentration offers a distinct cost advantage at high cell costs. However, they also show that concentration has the potential for being a viable alternative to the flat unconcentrated arrays for cell costs as low as \$50/sq m. Also, for a given concentrator cost, cell cost and cell cooling effectiveness, there exists an optimum effective aperture area to cell area ratio. For reasonable projected cell costs, this optimum ratio is below 30 for passively cooled devices and below 60 for actively cooled systems.

(Author)

**A77-41580** The effect of design and operating parameters on the performance of flat plate solar collectors - Calculation method and detailed appraisal. T. P. Woodman (Eidgenössische Technische Hochschule, Zurich, Switzerland). *Solar Energy*, vol 19, no 3, 1977, p 263-270. 5 refs.

This paper provides the engineer with the basic equations for calculating collector performance as a function of design and operating parameters and indicates the method of solution using a programmable desk calculator. The method is used to investigate the sensitivity of collector output to ambient air temperature, absorber plate temperature and emissivity, wind speed, atmospheric IR radiation and the number of cover plates. An analysis of losses from the absorber plate shows that reduction of radiation losses through reduced emissivity results in an absolute increase in convection losses, so that in the absence of measures to suppress convection, the attainment of emissivities below about 0.3 is hardly worthwhile. On the other hand, the use of two cover plates instead of one is shown to be nearly always beneficial. Analysis of losses from the outer cover plate shows that changes of the air temperature have a marked effect on the relative importance of radiation and convection as loss mechanisms. Problems connected with the use of the temperature difference between absorber and ambient air as a parameter are also discussed.

(Author)

**A77-41581** Ellipsometry in the study of selective radiation-absorbing surfaces. E. M. Lushiku and K. R. O'Shea (Dar es Salaam, University, Dar es Salaam, Tanzania). *Solar Energy*, vol 19, no 3, 1977, p 271-276. 14 refs.

Ellipsometry is an inexpensive technique whereby the optical properties of surfaces are investigated by analyzing the polarization of reflected light. The experimental system consists of a source of monochromatic light of known wavelength, a suitable quarter wave plate, and two polaroids, mounted on rotatable discs with circular vernier scales for measuring the orientation of the transmission axes with respect to the plane of incidence. The system provides sensitive measurements of both optical constants and coating thicknesses, which are then used to compute the reflectivity of the surface at different wavelengths. The method was applied to single and double black nickel layers electro-deposited on polished copper substrates using the Silo and Mladinik (1969) electrolyte (nickel ammonia sulfate, zinc sulfate, potassium thiocyanide). Results are in good agreement with previously reported data.

C. K. D.

**A77-41582** Simulation analysis of passive solar heated buildings - Preliminary results. J. D. Balcomb, J. C. Hedstrom, and R. D. McFarland (California, University, Los Alamos, N. Mex.). *Solar Energy*, vol 19, no 3, 1977, p 277-282. 6 refs. ERDA-sponsored research.

Solar gains through windows, walls, modified walls, skylights, clerestory windows, and roof sections provide an opportunity to dramatically reduce the total heating energy requirements of a building. Many such passive solar heating elements are currently available to a designer presenting a large number of possible system designs. A computer simulation analysis has been employed to aid in the selection of components. The results indicate that a performance comparable to that of a conventional active solar heating system should be achievable in an optimized design passive solar heating system. The placement and type of thermal storage is crucial to good performance. Movable insulation of the window increases the

performance. When used in conjunction with a conventional heating system, temperature variations in the building can be reduced to those normally experienced.

(Author)

**A77-41583** The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell. T. I. Quickenden and G. K. Yim (Western Australia, University, Nedlands, Australia). *Solar Energy*, vol 19, no 3, 1977, p 283-289. 40 refs.

The power conversion efficiency of the photoelectrochemical cell Au-Rhodamine B-Au was found to be about 2.4 millionths per cent under typical operating conditions. A ten-fold improvement could be expected from constructional modifications, but further increases in efficiency would require changes in the cell chemistry. The low power conversion efficiency can be related to a low (0.47 per cent) efficiency for the production of the open circuit photovoltage, a low (0.22 per cent) quantum efficiency for the production of the short circuit current, and to markedly non-rectangular voltage-current characteristics. The deviations from a rectangular relationship and the low efficiency of current production arise from mass-transport limitations rather than from ohmic losses or activation polarisation. The low voltage efficiency probably arises from inefficiencies in the photochemical and electron transfer steps which lead to photovoltage production. The limitations of this type of cell as a solar energy conversion device are discussed.

(Author)

**A77-41584 \*** A comparison of GaAs and Si hybrid solar power systems. J. H. Heinbockel and A. S. Roberts, Jr. (Old Dominion University, Norfolk, Va.). *Solar Energy*, vol 19, no 3, 1977, p 291-300. 35 refs. Contract No. NAS1-11707-86.

Five different hybrid solar power systems using silicon solar cells to produce thermal and electric power are modeled and compared with a hybrid system using a GaAs cell. Among the indices determined are capital cost per unit electric power plus mechanical power, annual cost per unit electric energy, and annual cost per unit electric plus mechanical work. Current costs are taken to be \$35,000/sq m for GaAs cells with an efficiency of 15% and \$1000/sq m for Si cells with an efficiency of 10%. It is shown that hybrid systems can be competitive with existing methods of practical energy conversion. Limiting values for annual costs of Si and GaAs cells are calculated to be 10.3 cents/kWh and 6.8 cents/kWh, respectively. Results for both systems indicate that for a given flow rate there is an optimal operating condition for minimum cost photovoltaic output. For Si cell costs of \$50/sq m optimal performance can be achieved at concentrations of about 10, for GaAs cells costing 1000/sq m, optimal performance can be obtained at concentrations of around 100. High concentration hybrid systems offer a distinct cost advantage over flat systems.

C. K. D.

**A77-41585** A new Chrome Black selective absorbing surface. P. M. Driver, R. W. Jones, C. L. Riddiford, and R. J. Simpson (New South Wales Institute of Technology, Broadway, Australia). *Solar Energy*, vol 19, no 3, 1977, p 301-306. 8 refs.

The quest for more efficient solar absorbers has resulted in the development of numerous coating techniques for the absorption panel itself. The Chrome-Black coating is an electroplated black-chrome coating on a copper substrate which combines the properties of high visible absorption, low infrared emission and excellent temperature stability in both air and vacuum environments. Results obtained show that surfaces may be produced both with high visible absorption to infrared emission ratios and with high absorption. Results were obtained assuming an air-mass 2 spectral distribution and a 50 deg C black body weighting for absorption and emission, respectively. All samples are known to be stable to at least 300 deg C. This type of coating would be expected to have good anti-corrosion properties and this has been confirmed by electro-chemical oxidation and reduction testing. A comparison is made between the topography of this coating and of sputtered metal surfaces.

(Author)

**A77-41587** Simulation study of several solar heating systems with offpeak auxiliary. P. J. Hughes, J. A. Duffie, and W. A. Beckman (Wisconsin, University, Madison, Wis.). *Solar Energy*, vol 19, no 3, 1977, p 317-319. 9 refs. Contract No. E(11-1)-2588.

Simulation models were used to evaluate and compare the performance of two offpeak auxiliary solar air heating systems, one with combined and one with separate storage of solar and auxiliary energy. Both systems were modeled with a flat plate collector and an evacuated cylindrical glass tube collector. Separate storage was shown to be superior to combined storage regardless of collector type, although the difference is relatively small in the case of evacuated tube collectors. The performance of systems with combined storage becomes less sensitive to storage size as the collector loss coefficient decreases. The minimum temperature of the combined storage system need not be varied month to month if a 2.4% performance penalty is acceptable. C K D

**A77-41638 Photovoltaics - The semiconductor revolution comes to solar.** A. L. Hammond. *Science*, vol 197, July 29, 1977, p 445-447.

Options in photovoltaic technology currently under investigation or development are described. Advances in both flat-plate and concentrating systems are discussed. Among the design breakthroughs outlined for concentrating systems are multiple-junction cells, for which theoretical efficiencies approach 40%, and thermovoltaic systems, in which light which passes through a photovoltaic cell is absorbed and reradiated at lower wavelengths to the cell by a refractory material. Current developments in crystal growth methods and progress towards automation of assembly processes are considered. C K D

**A77-41645 Nuclear fusion - Focus on Tokamak.** D. Steiner (Oak Ridge National Laboratory, Oak Ridge, Tenn.) *IEEE Spectrum*, vol 14, July 1977, p 32-38.

An overview of nuclear fusion engineering is presented covering basic fusion technology, magnetic and inertial confinement schemes, fusion fuel, tritium breeding, blankets, tritium containment and disposal, fusion process waste management, power generation costs, environmental impact, and safety. Attention is focused on closed magnetic confinement systems, specifically Tokamak systems. The outlook for pulsed/batch or continuous Tokamak operation is assessed. Power supplies for driving plasma current and for neutral-beam injectors, the radioactivity (intensity and decay times) of fusion reactor wastes, and anticipated costs of fusion-generated power and fusion reactor safety engineering are dealt with. Applications of fusion reactors other than electric power generation are discussed (hybrid fission-fusion systems, breeding fissionable material and burning high-level wastes, synthetic fuel production, radiation processing). R.D.V.

**A77-41649 Energy from bioconversion of waste materials.** D. J. De Renzo. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 11, Pollution Technology Review, No. 33), 1977. 236 p. 177 refs. \$32.

The production of gas by bioconversion of solid wastes is discussed. The amount of organic matter potentially available from a variety of sources, including urban wastes, agricultural by-products, animal wastes, industrial wastes, and biomass crops grown specifically for bioconversion is estimated. Anaerobic decomposition processes are outlined, and controlling factors in methane fermentation are considered. The results obtained in a wide range of studies involving systems for urban trash methanation, bioconversion of solid waste and sewage sludge, methane production from energy crops, and animal waste digestion are presented. C K D

**A77-41683 Minor radius compression experiments.** D. C. Robinson (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Symposium on Plasma Heating in Toroidal Devices, 3rd, Varenna, Italy, September 6-17, 1976, Lectures and Contributed Papers. Bologna, Editrice Compositori, 1976, p. 168-172. 16 refs.

Adiabatic compression in the minor radius as used by the TUMAN and TOSCA Tokamaks is described. Adiabatic compression

is used to supplement ohmic heating, which by itself is insufficient to produce ignition (other than possibly at low densities). Scaling, equilibrium, and stability of a minor and minor-major radius compression are discussed. Results are presented for both TOSCA and TUMAN. Procedures are suggested for organizing experiments with TOSCA for the purpose of improving the overall efficiency of ohmic heating. M L

**A77-41698 Neutral injection at PPPL, past and present.** R. R. Smith (Princeton University, Princeton, N.J.). In: Symposium on Plasma Heating in Toroidal Devices, 3rd, Varenna, Italy, September 6-17, 1976, Lectures and Contributed Papers. Bologna, Editrice Compositori, 1976, p. 254-258. 14 refs. Contract No. E(11-1) 3073.

Physical parameters are compared for the injection of energetic atoms into plasmas produced by the Adiabatic Toroidal Compressor (ATC) and by the Princeton Large Torus (PLT). The ion temperature increase in the ATC remained nearly linear at 1 eV per KW up to 230 KW. The results are compared with the predictions of a simulation code, and this model's predictions for the PLT and the Princeton Diverto Experiment are presented. M L

**A77-41706 Heating of the Frascati Tokamak by means of quasi-perpendicular neutral injection.** M. Haegi (EURATOM and Comitato Nazionale per l'Energia Nucleare sulla Fusione, Centro Gas Ionizzati, Frascati, Italy) and E. Bittoni (Comitato Nazionale per l'Energia Nucleare, Centro di Calcolo, Bologna, Italy). In: Symposium on Plasma Heating in Toroidal Devices, 3rd, Varenna, Italy, September 6-17, 1976, Lectures and Contributed Papers. Bologna, Editrice Compositori, 1976, p. 293-295. 6 refs.

**A77-41710 Additional heating and refuelling for the ASDEX divertor Tokamak.** G. Haas, M. Keilhacker, A. Stabler (Max-Planck-Institut für Plasmaphysik GmbH, Garching, West Germany), W. Henkes, and R. Klingelhofer (Max-Planck-Institut für Plasmaphysik GmbH, Garching, Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany). In: Symposium on Plasma Heating in Toroidal Devices, 3rd, Varenna, Italy, September 6-17, 1976, Lectures and Contributed Papers. Bologna, Editrice Compositori, 1976, p. 308-317. 28 refs. EURATOM-sponsored research.

**A77-41712 Plasma heating systems planned for the Argonne experimental power reactor.** P. Bertoini, J. Brooks, J. Fasolo, F. Mills, A. Moretti, and J. Norem (Argonne National Laboratory, Argonne, Ill.). In: Symposium on Plasma Heating in Toroidal Devices, 3rd, Varenna, Italy, September 6-17, 1976, Lectures and Contributed Papers. Bologna, Editrice Compositori, 1976, p. 326-332. ERDA-sponsored research.

**A77-41718 Additional heating in JET.** J. Sheffield (EURATOM and U.K. Atomic Energy Authority, Culham Laboratory, Abingdon, Oxon, England). In: Symposium on Plasma Heating in Toroidal Devices, 3rd, Varenna, Italy, September 6-17, 1976, Lectures and Contributed Papers. Bologna, Editrice Compositori, 1976, p. 362-364. 16 refs. Contract No. EURATOM-30-74-IFUA-C.

The objectives of JET are summarized and the heating power required to achieve them is determined. It is shown that Ohmic heating, which is the main source of energy in present Tokamaks, will not be adequate in JET unless either the energy confinement time is very favorable or there is a large resistance anomaly. It is proposed to bridge the gap between the required power and Ohmic power with neutral injection, radio frequency heating and adiabatic compression. The application of these techniques to JET is discussed. (Author)

**A77-41722 Study of the feasibility of exploiting the galloping phenomenon as energy source.** (Etude de la possibilité de l'emploi du phénomène du galop comme source d'énergie). A.

Laneville (Sherbrooke, Université, Sherbrooke, Quebec, Canada) *Canadian Society for Mechanical Engineering, Transactions*, vol 4, no 1, 1976-1977, p 23-26 7 refs In French

Aeroelastic galloping, or vibrations of an aerodynamically unstable prism, is explored as a potentially useful conversion mechanism for exploiting wind energy. Vibrations associated with shedding of vortices are assumed present. The shed vortices generate oscillations of the galloping prism only when the Strouhal frequency corresponds to the prism natural frequency (at a single wind velocity). The efficiency of the mechanism is found questionable for the application in mind. The orientation of the prism in a wind field constantly changing in direction, turbulence spectra, and conversion of the constant frequency generated to 60 Hz by an appropriate set of masses and springs, are considered. R D V

**A77-41741 High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition.** R D Dupuis, P. D. Dapkus, R. D. Yingling, and L. A. Moudy (Rockwell Electronics Research Center, Anaheim, Calif.) *Applied Physics Letters*, vol 31, Aug 1, 1977, p. 201-203, 14 refs Contract No. E(04-3)-1202.

High-efficiency GaAlAs/GaAs heterostructure solar cells have been grown by metalorganic chemical-vapor deposition (MO-CVD). Simulated air-mass-zero (AM0) short-circuit current densities of 24.5 mA/sq cm, open-circuit voltages of 0.99 V, fill factors of 0.74, and efficiencies of 12.8% have been measured on devices without AR coatings (uncorrected for contact area). These cell structures employ a thin (about 520 Å) GaAlAs Zn window and a GaAs Zn/GaAs.Se p-n junction grown entirely by the MO-CVD process. (Author)

**A77-41800 The flow of heat from the earth's interior.** H N Pollack (Michigan, University, Ann Arbor, Mich.) and D S Chapman (Utah, University, Salt Lake City, Utah). *Scientific American*, vol 237, Aug 1977, p 60-68, 73-76

The major findings highlighted in a survey of the relationship between plate tectonics and heat flow from the earth's interior are: (1) heat flow decreases with increasing age of the geological province in question, (2) a definite relationship obtains between surface heat flow and the radioactivity of surface rocks over large continental areas. Problems in mapping heat flow on a global basis, and specifically at continental and oceanic surfaces, are reviewed. Two components to heat flow are noted: a crustal component and a deeper component originating in the mantle. A world map of geothermal heat flow measurements is displayed. Sea-floor spreading, subduction zones and heat-flow patterns at such zones, and the contribution of surface radioactivity to surface heat flow (40%), are discussed at length. R D V.

**A77-41822 The unitary heat pump industry - 25 years of progress.** J A Pietsch (General Electric Co., Air Conditioning Business Div., Tyler, Tex.) (Illinois Institute of Technology, American Power Conference, Chicago, Ill., Apr 18-20, 1977) *ASHRAE Journal*, vol 19, July 1977, p 15-18

The history of heat pump development in the U.S. is reviewed, and the relative attractiveness of electric furnaces, heat pumps, and solar heating systems is discussed. Commercial distribution of heat pump units, which was initiated in the early 1950s, suffered declines in the 1960s due to a record of poor reliability, but registered rapid growth after 1970, when higher electricity costs made electric furnaces less competitive, and improved quality control increased the attractiveness of heat pumps. Heat pumps, involving higher initial costs than electric furnaces, are attractive as long as their efficiency (200% or more) provides an eventual return on the investment. Solar heating systems, with high seasonal efficiencies (400 to 600%), nevertheless may not be attractive investments if initial costs are very high. In developing new heat pump designs, tradeoffs between increased efficiency and higher initial cost need to be made. J M B

**A77-41823 The annual cycle energy system - A hybrid heat pump cycle.** R A Biehl (Robert G. Werden Associates, Inc., Jenkintown, Pa.) *ASHRAE Journal*, vol 19, July 1977, p 20-24

A year-round heating and cooling system based on a heat pump is described. In cool weather down to a temperature of 4°C the system functions as an air-source heat pump, while at lower temperatures it becomes a water-source heat pump employing the latent heat of fusion given up by water in its change of phase to ice. Furthermore, in warm weather the system provides cooling from a bank of stored ice. Various modes of operation, which may involve combinations of the system's collector/radiator capabilities, defrosting mechanisms, and the cooling capacity of the ice storage tank, are discussed, a microprocessor which accumulates data from ambient and interior sensors determines the most appropriate mode for given circumstances. Details of construction for the ice storage tank are also given. Advantages of the system include: it annually consumes 40% less energy than a conventional system, the payback period, now about 11 years, could be reduced to a commercially acceptable level of 6 to 8 years by advances in the design of the ice storage tank. J M B

**A77-41824 10 design principles for air-to-air heat pumps.** A Trask. *ASHRAE Journal*, vol 19, July 1977, p 30-33

Alterations in the design of air-to-air heat pumps are suggested with the aim of increasing the efficiency of the device and reducing mechanical failure in the compressors, the chief source of unreliability in the air-to-air heat pumps. Stresses encountered by the compressors during the defrost cycle may be decreased by introduction of an evaporator pressure-regulating valve, or constant pressure (CP) valve, to take the place of the accumulator presently used. Like the accumulator, the CP valve would prevent liquid floodback into the compressor at the beginning of heating cycles. Furthermore, it would circumvent problems caused by evacuation of the crankcase and outdoor coil during the defrost cycle, assure constant lubrication of the compressor, lead to a shorter defrost cycle, and permit defrosting down to an outdoor temperature of -20°F. By maximizing use of available heat and eliminating the accumulator and other mechanisms, the modified air-to-air heat pump would increase both its effectiveness and reliability at relatively low cost. J M B

**A77-41851 Solar ponds - Low cost solar energy management systems.** L H Shaffer. *Energy*, vol 2, Summer 1977, p 18-20

The large areas required to obtain significant amounts of heat or work from solar energy lead to high collector costs. A five- to tenfold reduction in manufacturing costs of photovoltaic silicon devices would bring the cost of DC energy without storage to \$500/peak KW, assuming an efficiency of 10%, flat collectors for solar-based heat cost \$20-30/sq ft. Solar ponds represent an approach which combines long term storage with low cost \$4 to \$10/sq ft. Three types of solar ponds - the salt stabilized solar pond, the shallow solar pond developed at the Lawrence Livermore Laboratory, and the viscosity stabilized pond - are discussed. The costs of each type of system are estimated. Difficulties which may be encountered in the construction and operation of solar ponds are considered. C K D

**A77-41852 Energy conservation by symbiosis.** E V Sherry (Air Products and Chemicals, Inc., Allentown, Pa.) *Energy*, vol 2, Summer 1977, p 21-23 9 refs

Methods whereby utilities and industries can cooperate to conserve energy, optimize investments, and produce goods and useful energy less expensively are discussed. A prime example of such cooperation is co-generation, where the use of fuels is optimized by generating steam for industry or district heating while producing electricity for the public. Other schemes involve recovery of energy and refrigeration stored in the latent heat and low temperature of liquefied natural gas, oxygen enrichment of utility combustion air, and joint use of synthetic natural gas plants to produce chemicals in addition to synthetic fuel. Factors responsible for the relatively slow development of 'symbiotic' relationships between industry and utilities are considered. Projects in the United States and Europe involving industry-utility cooperation are described. C K D

**A77-41855 # The roles of aerospace organizations in energy development or can aerospace success bring success in energy.** H B.

Finger (GE Center for Energy Systems, Washington, D.C.). *AIAA, EEl, and IEEE, Conference on New Options in Energy Technology, San Francisco, Calif., Aug. 2-4, 1977, AIAA Paper 77-1001*. 5 p.

To cope with energy shortages, the U.S. needs to reduce its reliance on imported oil, emphasize fuel conservation programs, increase its use of coal and fissionable fuel, and support research and development of alternate energy systems. The aerospace industry has already undertaken research into solar electric power generation, wind-generated power systems, and microwave transmission of space solar energy. Solar heating and cooling, fuel cells, and centrifuge technology for uranium enrichment seem economically viable systems, but their cost and performance competitiveness will be determined in the marketplace. Suggestions for improving the rate of development of viable alternate systems include collaboration between the aerospace industry and businesses having expertise in marketing, the organization of large-scale testing facilities, and government aid when high-risk development programs are involved. J.M.B.

**A77-41856 # Solar energy - Promises and pitfalls.** R. B. Peterson (Grumman Energy Systems) *AIAA, EEl, and IEEE, Conference on New Options in Energy Technology, San Francisco, Calif., Aug. 2-4, 1977, AIAA Paper 77-1022*. 15 p. 13 refs.

Although solar energy systems cannot be justified economically as providers of 100% of a home's heating requirements, combinations of solar heating and conventional utilities for space and hot water heating are feasible. Studies by Mitre-ERDA and the Office of Technology Assessment indicate that in most parts of the U.S. solar heating is now competitive with electricity, in many areas, tax incentives may make it competitive with oil and gas systems as well. However, there is need for government rating of the efficiency and durability of solar energy collectors and rating of the BTU output of solar energy systems, so that consumers may better judge their efficacy. A demonstration home equipped with heavy insulation and a solar energy system was found capable of obtaining 40-50% of its space heating needs from solar heating, as opposed to 20% without the insulation. Thus, good insulation practices and elimination of tax penalties for solar heating installations will increase their viability as economical systems. J.M.B.

**A77-41865 # Optimum concentration ratio for a solar central-receiver electric power plant.** J. W. Baughn (California, University, Davis, Calif.) and J. B. Bergquam (California State University, Sacramento, Calif.) *ASME, Transactions, Series A - Journal of Engineering for Power*, vol. 99, July 1977, p. 490, 491. 8 refs.

**A77-41902 Investigation of energy parameters of low-temperature ring thermopiles.** M. A. Markman, L. M. Simanovskii, and I. R. Iurkevich (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR) (*Geliotekhnika*, no. 6, 1976, p. 11-13) *Applied Solar Energy*, vol. 12, no. 6, 1976, p. 7, 8. Translation.

The energy parameters of annular low-temperature thermal batteries for clamped tubular modules were investigated. The average values of thermal battery parameters were measured in the whole operating temperature range. A comparison was made of the efficiency of thermal batteries, in which thermoelectric materials of various types were used, as a function of the temperature range of their application. P.T.H.

**A77-41905 Method for calculating the profiles of foci and focal lines.** V. K. Baranov (*Geliotekhnika*, no. 6, 1976, p. 24-28) *Applied Solar Energy*, vol. 12, no. 6, 1976, p. 17-19. Translation.

Techniques are described for rapid and practically exact construction of profiles of parabolo-toroidal focusing concentrators and parabolo-cylindrical focusing wedges. Values of the radius vectors needed for constructing the profile of the parabola are tabulated. An example of the design of a profile of a focusing concentrator and a focusing wedge with parametric angle of 20 deg is given. P.T.H.

**A77-41906 Experimental setup for measuring space and energy characteristics of solar concentrators.** B. A. Bazarov and V. M. Kapeliushnikov (Akademiia Nauk Turkmensoi SSR, Fiziko-Tekhnicheskii Institut Ashkhabad Turkmen SSR) (*Geliotekhnika*, no. 6, 1976, p. 29-34) *Applied Solar Energy*, vol. 12, no. 6, 1976, p. 20-23. 5 refs. Translation.

**A77-41907 Concentrating capability of spherical facets.** R. A. Zakhidov (Akademiia Nauk Uzbeksoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR) and A. Sh. Khodzhaev (Akademiia Nauk Uzbeksoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) (*Geliotekhnika*, no. 6, 1976, p. 35-37) *Applied Solar Energy*, vol. 12, no. 6, 1976, p. 24, 25. Translation.

Formulas are derived for calculating irradiance in the radiation field of a spherical facet. It is shown that the concentrating power of spherical and parabolic facets are identical. P.T.H.

**A77-41909 Composite concentrators with spherical radiation sources.** L. Ia. Paderin (Tsentral'nyi Aerogidrodinamicheskii Institut, Moscow, USSR) (*Geliotekhnika*, no. 6, 1976, p. 43-51) *Applied Solar Energy*, vol. 12, no. 6, 1976, p. 30-36. Translation.

The paper describes a method for calculating the distribution of luminous fluxes from spherical sources of radiation on irradiated surfaces of composite concentrators. These concentrators consist of sets of conical or spherical rings of equal width which intersect at their initial and terminal sections ellipsoids of revolution. The distribution of luminous fluxes in the focal plane of the generator of the ellipsoidal surface is then calculated. The results enable making a choice of optimal parameters of composite concentrators. P.T.H.

**A77-41910 Fundamentals of solar-energy survey development.** R. B. Salieva (Tashkentskii Elektrotekhnicheskii Institut Sviazi, Tashkent, Uzbek SSR) (*Geliotekhnika*, no. 6, 1976, p. 61-77) *Applied Solar Energy*, vol. 12, no. 6, 1976, p. 45-57. 12 refs. Translation.

The paper examines some of the principles of developing a solar energy inventory on the basis of a mathematical model, by the parameters of which it would be possible to determine the productivity of a solar energy facility of any design and establish its effectiveness and suitability for various types of landscapes. The mathematical model is considered from unified viewpoints of stochastic process theory. Modeling algorithms are given and results of computer calculations are given in tables, from which one can deduce the productivity and utilization factor of the rated power of facilities of arbitrary design. P.T.H.

**A77-41933 # Have energy, will travel.** J. E. Allen (Hawker Siddeley Aviation, Ltd., Kingston-on-Thames, Surrey, England). In: The place of aviation in society, Proceedings of the Fifteenth Anglo-American Aeronautical Conference, London, England, May 31-June 2, 1977. London, Royal Aeronautical Society, 1977. 30 p. 37 refs.

An investigation is conducted concerning the possibilities to obtain the energy needed for aviation in the future, in the face of the progressing depletion of petroleum resources. The approaches considered include a diversion of oil for premium transport use, the development of low fuel-use aircraft, an employment of kerosene synthesized from coal or shale, and a worldwide introduction of liquid hydrogen for aircraft. Attention is also given to the prospects of lighter-than-air vehicles, fusion power, solar energy systems, and the production of alternative liquid hydrocarbons from vegetables, wood, and municipal waste. G.R.

**A77-41939 # Competitive restraints on air travel - Ground modes and telecommunications.** R. S. Shevell (Stanford University, Stanford, Calif.). In: The place of aviation in society, Proceedings of the Fifteenth Anglo-American Aeronautical Conference, London, England, May 31-June 2, 1977. London, Royal Aeronautical Society, 1977. 16 p. 7 refs.

The reported investigation shows that advanced ground modes will compete successfully with air transportation at short ranges on

high density routes Improved trains are the most likely form for future short range public ground transportation The high initial guideway cost will limit track levitated vehicles to a few very high density routes, if indeed it exists at all As distances increase beyond the range from 300 to 500 kilometers, the air mode becomes increasingly preferable both in speed and cost Except for the minimum cost mode, the bus, aircraft will provide public transportation at ranges beyond 800 kilometers G R

**A77-41943 # North American freight transportation - Near or incipient chaos.** H V Braceland (Air Canada, Montreal, Canada). In The place of aviation in society, Proceedings of the Fifteenth Anglo-American Aeronautical Conference, London, England, May 31-June 2, 1977 London, Royal Aeronautical Society, 1977. 17 p

The existing freight transport system in North America is discussed Shipping patterns for all modes of transportation are outlined Advantages and disadvantages of different modes of freight transport are considered in the light of present requirements, and their ability to adapt to future requirements imposed by environmental factors, fuel shortages, and volume growth is assessed Specific goals for modernization and coordination of the freight transport system as a whole are suggested Problem areas are pinpointed

C K D

**A77-41944 \* # A view of the future - Constraints and opportunities** G G Kayten (NASA, Washington, D C ) In The place of aviation in society, Proceedings of the Fifteenth Anglo-American Aeronautical Conference, London, England, May 31-June 2, 1977 London, Royal Aeronautical Society, 1977 18 p. 12 refs

Social and economic trends which could affect the growth of aviation in the next thirty years are examined The possible effect of these trends together with the effects of national policies, environmental concerns, possible and probable technological advancements and the world energy problem on the developments in conventional subsonic passenger transports, long-range, high-speed aircraft, short haul operations, and air cargo transport are discussed Passenger volume predictions from different sources are presented and contrasted, and the efficiency of turboprops and turbofans is compared

C K D

**A77-41969 # Advanced supersonic transport propulsion requirements** R W Hines (United Technologies Corp, Pratt and Whitney Aircraft Group, East Hartford, Conn ) *American Institute of Aeronautics and Astronautics and Society of Automotive Engineers, Propulsion Conference, 13th, Orlando, Fla, July 11-13, 1977, AIAA Paper 77-831* 7 p 8 refs

One of the most promising propulsion systems (The Variable Stream Control Engine) for supersonic commercial transport application is reviewed The benefits of advanced propulsion technology, as applied to the Variable Stream Control Engine, are presented on an overall systems basis showing the full impact on a supersonic transport airplane from an environmental, performance, and economic viewpoint The advanced propulsion program, required for the United States to maintain a competitive position in the future commercial airplane market, is also presented (Author)

**A77-42038 The impact of the energy crisis on the demand for fuel efficiency - The case of general aviation.** R B Archibald and W S Reece (U S Department of Labor, Bureau of Labor Statistics, Washington, D C ) *Transportation Research*, vol 11, June 1977, p 161-165 17 refs

One of the most important questions accompanying the debate over energy policy is whether or not consumers will react to increased fuel prices by choosing more fuel efficient transportation modes This paper addresses this question by developing a theoretical rationale for the hypothesis that the energy crisis has induced an increase in the demand for fuel efficiency as a characteristic of aircraft and empirically tests this hypothesis with data from the U S general aviation market (Author)

**A77-42071 Wind structure in strong winds below 150 m.** H A Panofsky (Pennsylvania State University, University Park, Pa ) *Wind Engineering*, vol 1, no 2, 1977, p 91-103 20 refs

Wind data are separated into mean wind data and wind fluctuations data for wind engineering purposes The distribution of mean wind over homogeneous terrain in strong winds, the effect of stability on wind profiles, the effect of terrain change on wind speed, variability of wind velocity (direction and magnitude), and the spectra and cross spectra of wind speed are discussed in separate sections Cross spectra between wind speeds at various positions are broken down into cospectrum and quadrature spectrum Selection of an appropriate averaging interval for the study of wind fluctuations is discussed R D V

**A77-42072 A theory and experimental investigation of ducted wind turbines** R I Lewis, J E Williams, and M A Abdelghaffar (Newcastle-upon-Tyne, University, Newcastle-upon-Tyne, England). *Wind Engineering*, vol 1, no 2, 1977, p. 104-125.

Practical wind turbine designs are examined and compared, with the object of selecting the one best suited to domestic use in low-level technology. Attention is focused in this paper on ducted (open) wind turbines Wind turbine (WT) ideal efficiency (ducted or unshrouded), total wind thrust on the system, design of a theoretical WT duct, diffuse design, and turbine design (blading and impeller) are described Experiments conducted on small and large ducts are described Results show that a gain in power output can be obtained from a WT of specified diameter by using a suitably shaped duct The optimum diffuser area ratio is found to be roughly 10% larger than the theoretically predicted value. Power output is maximized when some stall exists at the diffuser outlet R D V

**A77-42073 Effects of wind fluctuations on windmill behaviour** W J G J der Kinderen, J J. E. A. van Meel, and P T Smulders (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands) *Wind Engineering*, vol 1, no 2, 1977, p 126-140 8 refs

A system-analytical approach is proposed to describe the output, i.e., power and forces, of a wind machine for the stochastic input signal, the wind A simple model is presented to describe the fluctuations of wind speed and direction by means of average wind speed and wind direction, their variances and time constants These input signals are used to calculate the influence of wind fluctuations on windmill performance, including the effects of nonuniformity of the flow in the rotor plane, rotor inertia and yawing of the rotor heat. Experimental results for a small 2-bladed windgenerator (diameter about 4 m) are reported. (Author)

**A77-42074 Variable speed wind turbines for high wind energy conversions** A Kling (Luftfahrzeug System, Berg, West Germany). *Wind Engineering*, vol. 1, no. 2, 1977, p. 141-149. 7 refs.

This study compares variable speed and constant speed rotor generator systems, and shows that under certain conditions the former may extract more than twice as much useful energy as the latter. Also suggested are a rotor configuration having less vibrational problems than the propeller and a high frequency generator specially adaptable to variable speed systems. (Author)

**A77-42075 The 'wind-wall' - An integrated wind/solar system.** J C. McVeigh (Brighton Polytechnic, Brighton, Sussex, England) and G W. W. Pontin (Wind Energy Supply Co., Peacehaven, Sussex, England). *Wind Engineering*, vol 1, no 2, 1977, p 150-158 5 refs.

Design of an integrated system combining a windmill system and solar panels is discussed The system is intended for power supply to residential areas A bank of fixed ducted windmills and batteries of solar collectors sharing a common overall site are considered in an arrangement providing hot water and space heating A water reservoir heat storage system, basic electrical system, and the pattern of energy supply and demand are outlined R D V

**A77-42151 Cryogenic Engineering Conference, Queen's University, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings** Conference supported by the Aerospace Corp, Japanese National Railways, National Bureau of Standards, et al Edited by K D Timmerhaus (Colorado, University, Boulder, Colo ) and D H Weitzel (National Bureau of Standards, Boulder, Colo ) New York,



Plenum Press (Advances in Cryogenic Engineering Volume 21), 1976 562 p \$42.50 (For individual items see A77-42152 to A77-42171)

Contributions to the 1975 Conference are grouped under the following main topics (1) superconducting magnets, (2) applied superconductivity systems design, (3) superconductive energy systems, (4) energy systems, (5) refrigeration, (6) instrumentation, (7) heat transfer and fluid dynamics, (8) liquefied natural gas technology, (9) safety, (10) cryo-bioengineering applications, (11) cryo-technology applications, (12) fluid properties. Among the specific topics discussed are magnets for levitation-aided transportation and for fusion reactors, superconductive energy transfer and storage, supercritical He refrigerators, cooling of long conduits, liquid He heat transfer, LNG storage tanks and carriers, cryogenic laser fusion targets, and reversible cryostorage of bio-materials. R D V

**A77-42156** Cryogenic design for large superconductive energy storage magnets. J A Hlal (Wisconsin, University, Madison, Wis.) and G E McIntosh. In Cryogenic Engineering Conference, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings. New York, Plenum Press, 1976, p. 69-77. Research supported by the Wisconsin Alumni Research Foundation, Wisconsin Electric Utilities Research Foundation and NSF.

Close attention is accorded to selection of operating temperature and cooling method. A computer program optimizing the temperature of a finite number of refrigerated thermal radiation shields is worked out, and typical shield temperatures are presented in tabular form. Pool boiling in normal He, forced convection with normal He, and superfluid He cooling are discussed. Minimization of thermal radiation heat leak to the energy storage magnet (by using cooled shields, superinsulation, or floating shields) is considered. Realizability of a completely stable magnet via pool cooling in superfluid He is indicated. R D V

**A77-42160** Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids. R C Amar, T H K Frederking, and W E Kästner (California, University, Los Angeles, Calif.). In Cryogenic Engineering Conference, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings. New York, Plenum Press, 1976, p. 109-114. 16 refs. Research supported by the Electric Power Research Institute.

**A77-42161** Applications of superconducting magnets to energy with particular emphasis on fusion power. P Komarek (Karlsruhe, Universität, Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany). In Cryogenic Engineering Conference, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings. New York, Plenum Press, 1976, p. 115-139. 65 refs.

The feasibility of employing superconducting magnets for energy conversion and energy storage, in addition to the use of superconductivity in power transmission, is explored. Prospects for commercial use of superconducting homopolar machines and MHD generators appear optimistic. Problems to be solved in the use of superconducting synchronous machines include turboalternator design, heat transfer and helium flow in rotating channels, fatigue and structure at cryogenic temperatures, and long-life rotating helium seals and vacuum seals. Fusion power via magnetic confinement remains the principal prospect for utilization of superconductivity in energy. Inductive energy storage systems are examined and compared to flywheel systems. Reliability of superconducting windings and their structure remain serious problems. R D V

**A77-42164** Element rating and coupling harmonics in a superconductive energy transfer system. R S Ramshaw and E P Dick (Waterloo, University, Waterloo, Ontario, Canada). In Cryogenic Engineering Conference, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings. New York, Plenum Press, 1976, p. 157-165. 5 refs.

An attempt is made to optimize system element rating, rather than system energy. An increase in transfer rate based on the use of nonsinusoidal coil coupling, with the zero-torque constraint main-

tained, is examined. System costs are optimized for rotor energy, system energy, or element energy. A modified coupling distribution arrived at enables a 30% decrease in theoretical transfer time. Inductance optimization is a crucial aspect of the approach. Mechanical torque measurement within the cryostat and the effect of ac superconductor losses on mechanical torque and load current are also discussed. R D V

**A77-42165** Economic aspects of U.S. energy independence in the coming decade. K D Timmerhaus (Colorado, University, Boulder, Colo.) and D H Weitzel (National Bureau of Standards, Boulder, Colo.). In Cryogenic Engineering Conference, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings. New York, Plenum Press, 1976, p. 166-179. 42 refs.

Currently available energy sources are surveyed (petroleum, natural gas, coal, oil shale, nuclear power, imported and domestic supplies), and a projection is advanced for the potential production capacity needed as of 1985 for the U.S. to achieve energy independence. Capital investment requirements for reaching such a goal comprise the principal constraint examined in the survey. The cryogenic aspects of the problem are summarized as: liquefied natural gas, conversion of coal to fuel gas (using tonnage oxygen from air separation plants), superconductors in power plants and transmission lines, superconducting instruments for geophysical exploration, and the 'hydrogen economy'. R D V

**A77-42166** Cryogenic fuel systems for motor vehicles. J J Hibi (Beech Aircraft Corp., Boulder, Colo.). In Cryogenic Engineering Conference, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings. New York, Plenum Press, 1976, p. 180-186. Discussion, p. 186. 9 refs.

The cryogenic fuels considered include liquid hydrogen, which is projected to be the fuel of the future, and liquid natural gas (LNG) for the near term. A design and development program for automotive LNG tanks is discussed. In LNG service, the automotive cryogenic tank prototype demonstrated a lockup time of nearly 14 days in laboratory tests. In conditions of actual field use, loss of fluid due to venting rarely occurred. On the basis of the program results, it is concluded that in areas where LNG is available in quantity LNG will continue to be an economical alternate fuel for fleet operators. Operation of a vehicle which was fueled with liquid hydrogen proved that safe and efficient operation is achievable. The preliminary system employed did not have the desired thermal or mechanical efficiency desired. However, it appears that the improvements needed are achievable without any major development efforts. G R

**A77-42254** Tropospheric oxidation of H<sub>2</sub>S. J L Sprung (California, University, Riverside, Calif.). In Advances in environmental science and technology. Volume 7. New York, Wiley-Interscience, 1977, p. 263-278. 54 refs. NSF Grant No. 75-15711.

In California, interest in H<sub>2</sub>S oxidation is stimulated by the possible development of geothermal resources, which could lead to the release of significant amounts of H<sub>2</sub>S into the troposphere. H<sub>2</sub>S is toxic, and the rate of its oxidation to SO<sub>2</sub> will affect the significance of H<sub>2</sub>S as an air pollutant. The tropospheric chemistry of H<sub>2</sub>S is surveyed, with attention to kinetic data useful for modeling atmospheric chemical reactions. Reactants, reactive intermediates, and homogeneous reactions are discussed in detail. M L

**A77-42259** # The possibility of using regression models for calculating the effect of weather conditions on electric energy demand (O vozmozhnosti primeneniya regressionnykh modelei dlia ucheta vlianiia pogodnykh uslovii na spros elektroenergiu). V. I. Shatalov and E. N. Kopach (Akademiia Nauk SSSR, Sibirskii Nauchno-Issledovatel'skii Institut Energetiki, Irkutsk, USSR). *Energetika*, vol. 20, May 1977, p. 36-40. 6 refs. In Russian.

**A77-42260** # An analytical study of the maximal heat-carrying capacity of heat pipes (Analiticheskoe issledovanie maksimal'noi teploperedavushchei sposobnosti teplovyykh trub). M. G. Semena, A. N. Gershuni, and B. M. Rassamakin (Kievskii Politekhnikheskii Institut, Kiev, Ukrainian SSR). *Energetika*, vol. 20, May 1977, p. 93-97. 10 refs. In Russian.



An analytical solution is obtained for determining the hydrodynamic limit of the heat-carrying capacity of a cylindrical heat pipe with an annular isotropic wick. The differential equation of fluid movement in the wick of the heat tube is solved by the separation of variables method using an orthogonalized basis. Experiments were conducted using water heat pipes with metal fiber wicks. The theoretical calculations were in basic agreement with the experimental results. M L

**A77-42262 #** Methodological questions concerning the evaluation of the economic potential of energy resources (Metodicheskie voprosy otsenki ekonomicheskogo potentsiala energeticheskikh resursov) A A Semenov (Severo-Zapadnyi Zaochnyi Politehnicheskii Institut, Leningrad, USSR) *Energetika*, vol 20, May 1977, p 112-116 5 refs In Russian

It is suggested that the economic significance of different forms of fuel resources are determined by trends in their national economic use. Resource supplies can be appraised in terms of their economic value. The calculation of value is achieved by forming a closed statistical system. Criteria are given for the economic potential of water resources. M L

**A77-42401 #** The oceans as a source of electricity D J Littler (Central Electricity Generating Board, London, England) *Aware*, July 1977, p 12-15

Several methods for extracting energy from the ocean are described. Floating installations to harness wave power include a cam-shaped rocking float that minimizes both reflection and transmission of energy, coupled rafts, the variations in whose surface profiles would operate pumps, and buoys that use wave-powered flap valves to displace air and drive air turbines. Large-scale devices employing any of these three designs could achieve practical efficiencies of 25 to 50% and provide an average of 10 megawatts of power. A voltaic cell that takes advantage of the differing levels of salinity in the ocean and fresh water, a heat engine using temperature differences between surface and deep water, and a generator powered by ocean currents are also mentioned. Tidal energy, though available for use at only a limited number of sites, may nevertheless provide the most economical and effective use of ocean energy. Development of the Rance estuary power station in France, which has a generating capacity of 240 megawatts, is described, and other possible installations in England and France are also considered. J M B

**A77-42406** Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures J J Simnick, C C Lawson, H M Lin, and K C Chao (Purdue University, West Lafayette, Ind.) *AIChE Journal*, vol 23, July 1977, p 469-476 22 refs. Research supported by the Electric Power Research Institute

A flow type of apparatus is built to give equilibrium gas and liquid samples at elevated pressures and temperatures while minimizing thermal decomposition. Saturated vapor and liquid compositions and K values are determined with this apparatus for the binary system hydrogen/tetralin (1,2,3,4-tetrahydronaphthalene) at four temperatures from 189.6 to 389.1 C, and seven pressures from 20 to 250 atm. Vapor pressures of tetralin are determined with the same apparatus, and values are reported at the four temperatures of this work. (Author)

**A77-42407** Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions H Hikita, S Asai, and T Tsuji (Osaka Prefecture University, Sakai, Japan) *AIChE Journal*, vol 23, July 1977, p 538-544 20 refs

The rates of absorption of pure sulfur dioxide into aqueous sodium bisulfite, sodium hydroxide, and sodium sulfite solutions with and without a surface active agent were measured at 25 C using a liquid jet column. For the sulfur dioxide-sodium hydroxide system, the rate of absorption into the solution without surface active agent was higher than that into the solution with surface active agent, indicating the existence of the interfacial turbulence. The absorption rates obtained for the present system under the conditions of no interfacial turbulence were in good agreement with the theoretical predictions based on the penetration theory. (Author)

**A77-42408** Charge characteristics of particles in coal derived liquids - Measurement and origin J D Henry, Jr and M T Jacques (West Virginia University, Morgantown, W Va.) *AIChE Journal*, vol 23, July 1977, p 607-609 11 refs. Contract No E(40-1)-5105

Measurements carried out on the sign of charges associated with particulates present in an unfiltered Solvent Refined Coal liquid with an initial 3:1 solvent/coal ratio are reported. A mechanism is advanced to account for both origin and sign of the observed charges. The origin of the net positive surface charge associated with electrophoretic mobility in coal-derived liquids is accounted for in terms of the acid base structure of asphaltic species, and the presence of protons. Positive charge is found conferred to particulate matter suspended in hydrogen donor solvent. The results are relevant to studies of electrically induced separations, interfacial collection or distribution to water for particulates removal, or flocculation. R D V

**A77-42412** Photocell using covalently-bound dyes on semiconductor surfaces M Fujihira, N Ohishi, and T Osa (Tohoku University, Sendai, Japan) *Nature*, vol 268, July 21, 1977, p 226-228 15 refs

Sensitization of tin oxide or titanium oxide photocells to wavelengths of light longer than ultraviolet may be achieved by chemically modifying the surface of photoelectrodes in aqueous media. Surface modification procedures are described, and tests are made of the spectral sensitization resulting from the progress of photocurrent spectra obtained from an amide-linked rhodamine B electrode and an ester-linked rhodamine B electrode are compared, while the spectra are identical in shape, the photocurrent of the ester-linked dye electrode is found to be two orders of magnitude greater than that of the amide-linked electrode. In the case of the amide-linked dye electrode, a nonconducting alkyl chain is suggested to act as an energy barrier intervening between semiconductor and dye, inhibiting adsorption of excited dye molecules by the electrode. The conjugated pi electronic system of the ester-linked electrode, which is less distant from the semiconductor, apparently results in a more efficient sensitization. J M B

**A77-42475** Large-scale applications of superconductivity. B B Schwartz and S Foner (MIT, Cambridge, Mass.) *Physics Today*, vol 30, July 1977, p 34, 35, 37-40, 42, 43. NSF-supported research

Engineering characteristics of superconducting materials are reviewed, and several applications of superconductors are given, including use in electrical motors and generators, as magnets for MHD and fusion power generators, as power transmission cables, and in magnetic levitation of high-speed vehicles. Properties of commercially available superconductors are discussed, and current approaches to engineering failure-proof superconductivity are considered, i.e., cryostatic stabilization, adiabatic stabilization, and dynamic stabilization. Problems in replacement of the copper conductors and iron flux circuits of generators by superconductors are mentioned, and the development of homopolar dc rotating machines is described. The three principal magnet confinement schemes for fusion reactors, Tokamak, magnetic mirror, and theta pinch, are also reviewed. Use of superconducting cables for power transmission, which presents some technological difficulties, could provide an extremely efficient alternative to present transmission lines. Magnetic levitation and propulsion by magnetic flux are described, with emphasis on the high speeds attained by the vehicles, and the low mechanical stresses to which they are subjected. J M B.

**A77-42482 #** A pressurized fluidized bed coal fired combined cycle electric power generation S Moskowitz (Curtiss-Wright Corp., Wood-Ridge, N.J.) *AIAA, EEl, and IEEE, Conference on New Options in Energy Technology, San Francisco, Calif., Aug 2-4, 1977, AIAA Paper 77-1013* 9 p

The combination of pressurized fluidized bed (PFB) technology and the gas-turbine - steam-turbine combined-cycle power system offers a unique opportunity for the production of clean cost-competitive electric power from the combustion of high-sulfur coal. It also offers the prospect of earlier commercialization than those systems requiring gasification or liquification of coal to clean fuels. The U.S. Energy Research and Development Administration is

sponsoring a project to design, construct, and operate a coal-fired PFB/gas turbine pilot electric power plant. The pilot plant, which will produce an equivalent of 16 MW of power, will address a number of key technical issues associated with PFB development. It will also provide design data to verify scale up of the PFB units to a commercial plant size suitable for the electric utility industry. The principles and advantages of fluidized bed combustion are described along with the concepts for integrating the combustor into a combined-cycle power plant. The development program and the results to date are briefly reviewed. (Author)

**A77-42483 # Large-scale space operations for Solar Power Satellites.** G. R. Woodcock (Boeing Aerospace Co., Seattle, Wash.). *AIAA, EEL, and IEEE, Conference on New Options in Energy Technology, San Francisco, Calif., Aug 2-4, 1977, AIAA Paper 77-1031* 16 p 9 refs

Analogies with industrial development and with the Saturn, Shuttle, and Skylab programs demonstrate the feasibility of Solar Power Satellites (SPS) that require space launch rates countable in flights per day, systems with very large mass and size, and large-scale construction techniques in orbit. SPS energy production is estimated to equal 400,000 barrels of oil per day throughout an SPS operational life of 30 years or more, low transport costs to low earth orbit and on to geosynchronous orbit are projected as a result of reusability of vehicles, high traffic volume, relatively rapid ground turnaround, and large payload capacity. Construction procedures and installation of reflector systems are discussed, and diagrams of fabrication methods and devices are presented. About 10 manhours would be needed to erect one ton of material, and a workforce of 500 to 700, working 10-hour shifts 6 days a week during a 90-day orbiting period, is projected. J M B

**A77-42556 Solar electricity - The hybrid system approach.** M. A. Duguay (Bell Telephone Laboratories, Inc., Holmdel, N.J.). *American Scientist*, vol. 65, July-Aug 1977, p. 422-427. 21 refs

Procedures for combining solar electrical generation with other services, such as heating and lighting, are discussed. In one hybrid system, a cylindrical mirror-type concentrator focuses light on a photovoltaic cell which transforms 10 to 20% of it to electricity. The solar cell is attached to a water pipe, and the remaining energy appears as heat which is recovered via the water pipe. In another hybrid system, the visible part of sunlight is used for lighting and the IR is converted to heat and electricity in solar cells. This system uses a 'cold' mirror which is a dielectric filter reflecting visible light and transmitting IR. The economics of these hybrid systems is considered. M L.

**A77-42560 # Solar satellites - Space key to our power future.** G. R. Woodcock (Boeing Aerospace Co., Seattle, Wash.). *Astronautics and Aeronautics*, vol. 15, July-Aug 1977, p. 30-43

Technology, costs, and environmental problems associated with Solar Power Satellites (SPS) are discussed, and the system is found to be a feasible alternative to other energy sources. The microwave transmission system of the SPS, employing phased array radar technology, is analyzed, transmission efficiencies of 60 to 70% are projected. Furthermore, the type of microwave used and the limits imposed on maximum beam strength would permit conformity with the most stringent public exposure standards in effect. An operational life of 30 years for the system, together with development of effective delivery programs and space construction techniques, would bring the cost of energy produced by SPS to competitive levels, a complete payback for the system may be expected after 1 to 3 years of operation. Design of the receiving antenna is considered, and a comparison is made between silicon photovoltaic cells and Brayton heat engines, two candidates for the energy conversion system. Development time for the entire SPS program is estimated. J M B

**A77-42561 # Creating a welcome for aerospace energy technology.** J. Grey (American Institute of Aeronautics and Astronautics, Inc., New York, N.Y.). *Astronautics and Aeronautics*, vol. 15, July-Aug 1977, p. 44-47

The role of the aerospace industry in developing alternate energy sources is discussed. In spite of the relatively limited funding

presently allotted by the Energy Research and Development Administration (ERDA) to aerospace technologies, and the small size of the aerospace component within the total energy research effort undertaken by private industry, there are many areas in which aerospace expertise is needed, including advanced combustion technology aimed at nitrogen oxide control and lower combustion noise levels, gas turbine systems, and first wall systems for magnetically contained fusion power plants, aerodynamic design to reduce fuel consumption, metallic, ceramic, and composite materials for high temperature and pressure environments, photovoltaic cells and collector/absorber systems for energy storage and transmission, transport and design of space-based solar power systems (SSPS), and ocean thermal energy conversion systems. In particular, development of SSPS, which presently receives very low funding, deserves additional attention. J M B

**A77-42590 Management analysis of nuclear allocation for the generation of electricity.** P. T. Antonopoulos and J. C. Turnage (Yankee Atomic Electric Co., Westboro, Mass.). *Nuclear Technology*, vol. 34, Aug 1977, p. 347-361. 15 refs

In an effort to provide a basis for satisfying nuclear utility needs in generation planning, an improved computational tool has been developed that is capable of determining near-optimal operating strategy for generation systems comprised of nuclear, fossil, hydro, and pumped storage units. This strategy attempts to minimize the system generation costs while maintaining an acceptable system reliability. The computer program developed, MANAGE, is capable of performing scoping calculations to analyze multicycle fuel management options. In applying MANAGE, the techniques of risk and decision analysis are found to be useful approaches to utility system planning under uncertainty. (Author)

**A77-42628 Predicted and measured finite-width effects in linear induction machines.** E. S. Pierson (Illinois University, Chicago, Ill.), R. Hanitsch, T. Huhns (Berlin, Technische Universität, Berlin, West Germany), and H. Mosebach (Braunschweig, Technische Universität, Braunschweig, West Germany). (*Institute of Electrical and Electronics Engineers, Annual Meeting, 10th, Atlanta, Ga., Sept. 28-Oct. 2, 1975*) *IEEE Transactions on Power Apparatus and Systems*, vol. PAS-96, July-Aug 1977, p. 1081-1086. 12 refs

A new method of calculating the variation of the magnetic flux density with the dimension perpendicular to the flux and motion directions has been developed for MHD induction machines. The force and power densities and totals are also determined. The new method is explained and compared with previous methods of calculating finite-width effects. The agreement of the calculated field profiles with some initial measurements is excellent. (Author)

**A77-42629 Finite length effects in linear induction machines with different iron contours.** H. Mosebach (Braunschweig, Technische Universität, Braunschweig, West Germany), T. Huhns (Berlin, Technische Universität, Berlin, West Germany), E. S. Pierson (Illinois University, Chicago, Ill.), and D. Herrmann (Institute of Technology, Bandung, Indonesia). (*Institute of Electrical and Electronics Engineers, Annual Meeting, 10th, Atlanta, Ga., Sept. 28-Oct. 2, 1975*) *IEEE Transactions on Power Apparatus and Systems*, vol. PAS-96, July-Aug 1977, p. 1087-1093. 20 refs

Finite iron and winding lengths are significant factors in determining the performance of linear induction machines. This study provides information on the effect of the iron contour on machine performance, and also aids in the evaluation of other analytical models by pointing out the importance of the proper treatment of finite iron length. The analytical model used here, developed by Mosebach, is based on Fourier series expansions of the electromagnetic quantities and the air-gap length. The magnetic flux density, current density, force density, and efficiency are compared for six iron contours. One case with a graded winding is also considered. (Author)

**A77-42632 Electric energy alternatives appraisal for New York State.** M. Becker (Rensselaer Polytechnic Institute, Troy, N.Y.) and A. Kaufman (New York State, Dept. of Public Service, Albany, N.Y.). (*Institute of Electrical and Electronics Engineers, American*

*Society of Mechanical Engineers, and American Society of Civil Engineers, Joint Power Generation Conference, Buffalo, N Y, Sept 19-23, 1976* ) *IEEE Transactions on Power Apparatus and Systems*, vol PAS-96, July-Aug 1977, p 1173-1178, Discussion, p 1178 Research supported by the New York State Energy Research and Development Authority

This paper describes a cooperative program involving staff of RPI, New York State, and the General Electric Company for appraisal of electric energy alternatives. The program has involved acquisition of a data base describing both established and potential technologies for the generation of electric energy, identification of relevant factors, considerations and policies with potential for influencing strategy selections, and the development of methods for processing the available information. This paper will provide an overview of the program and will discuss specific examples of results obtained to date (Author)

**A77-42633** Putting alternative sources of energy into prospective R A Budenholzer and Z Lavan (Illinois Institute of Technology, Chicago, Ill ) (*Institute of Electrical and Electronics Engineers, American Society of Mechanical Engineers, and American Society of Civil Engineers, Joint Power Generation Conference, Buffalo, N Y, Sept. 19-23, 1976* ) *IEEE Transactions on Power Apparatus and Systems*, vol PAS-96, July-Aug 1977, p 1190-1195 11 refs

Proposed alternate forms of energy are compared with traditional energy sources for their possible respective contributions to meeting the nation's energy needs over the next several decades. Sources of energy consumption (residential/commercial, industrial, transportation, and electric power generation), estimated reserves of fossil fuels, and uranium fuel reserves are tabulated. The alternative sources discussed are nuclear power, hydroelectric and tidal power, oil shale and tar sand, synthetic fuel, geothermal energy, ocean thermal gradients, solar energy, and wind energy R D V

**A77-42634** The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface D P Carroll, G E Gareis, C M Ong (Purdue University, West Lafayette, Ind ), and P Wood (Westinghouse Research and Development Center, Pittsburgh, Pa ) (*Institute of Electrical and Electronics Engineers, Winter Meeting, New York, N.Y., Jan 30-Feb 4, 1977* ) *IEEE Transactions on Power Apparatus and Systems*, vol PAS-96, July-Aug 1977, p 1202-1210 5 refs Research supported by the Electric Power Research Institute

Prominent problems confronting energy storage or energy conversion technologies on a utility distribution system, and parameters of major concern in the specification and design of conversion equipment and ancillary equipment, are addressed. The performance of the line-commutated converter and force-commutated converter is compared. Three-phase computer simulations of typical system configurations aid a study of steady-state and transient phenomena. Equivalent circuits of battery and fuel cell modules are constructed, and studies are made of capacitor switching and load switching, ac voltage disturbances, power changes and load following, power reversal, system faults, and dc interruption R D V

**A77-42635** The interaction of batteries and fuel cells with electrical distribution systems - Force commutated converter interface G E Gareis, D P Carroll, C M Ong (Purdue University, West Lafayette, Ind ), and P Wood (Westinghouse Research and Development Center, Pittsburgh, Pa ) (*Institute of Electrical and Electronics Engineers, Winter Meeting, New York, N Y, Jan 30-Feb 4, 1977* ) *IEEE Transactions on Power Apparatus and Systems*, vol PAS-96, July-Aug. 1977, p 1242-1250 7 refs Research supported by the Electric Power Research Institute

Use of a force-commutated converter (FCC) system incorporating phase angle voltage regulation (PAVR) is studied by a simulation technique. A second 12-pulse bridge was added to implement PAVR, the effects of the commutation circuits were added to the converter simulation, the ac system was expanded, and harmonic filters were added. Principal objectives of the study are (1) ascertain the effect

of various dc sources on the operating characteristics of a FCC system, (2) identify any problems in the operation of the converter system on a utility system, and (3) evaluate the FCC performance as compared to that of a line-commutated converter using the same dc sources and ac system R D V

**A77-42636** Hybrid simulation of fuel cell power conversion systems L H Michaels, B T Fairchild (Electronic Associates, Inc, West Long Branch, N J ), and S T Kohn (United Technologies Corp, Power Systems Div, South Windsor, Conn ) (*Institute of Electrical and Electronics Engineers, Winter Meeting, New York, N Y, Jan 30-Feb 4, 1977* ) *IEEE Transactions on Power Apparatus and Systems*, vol PAS-96, July-Aug 1977, p 1329-1336 5 refs

Simulation techniques and results are presented for hybrid computer studies of line-commutated and self-commutated three phase bridge inverters. The line-commutated bridge system included constant extinction angle control of the inverter, power regulation of the DC source, and power factor correction capacitors. Simulation of this system was performed in real-time which allowed testing of prototype control hardware. The self-commutated system consists of three bridges operating in a phased sequence which permits elimination of harmonics by cancellation. System performance is evaluated with the inverters operating into a three phase load, part of which is supplied by the utility system. The paper discusses the computational techniques used in simulating systems of this type, including the role of the digital and analog computers in each study. This work supports the conclusion that hybrid simulation is a valuable tool for analysis and evaluation of power conversion systems which contain current switching devices (Author)

**A77-42637** An econometric analysis of energy over the next 75 years R W Schmitt, D J BenDaniel, P J Stewart (General Electric Co, Schenectady, N Y ), and A S Manne (Stanford University, Palo Alto, Calif ) (*Institute of Electrical and Electronics Engineers, American Society of Mechanical Engineers, and American Society of Civil Engineers, Joint Power Generation Conference, Buffalo, N Y, Sept 19-23, 1976* ) *IEEE Transactions on Power Apparatus and Systems*, vol PAS-96, July-Aug 1977, p 1353-1361 6 refs

The mix of base-load power generation systems expected from various energy sources over the next 75 years is studied. The longer-run projection is recommended as a corrective for short-range forecasts ignoring some constraints which emerge only in the long run. Lead times for significant contributions of new and presently untested technology to electrical energy demand are taken into account, research expenditures on highly speculative energy technologies (fusion, solar electric, and MHD) are not expected to yield results in less than half the time covered. The prediction model accounts for electrical and nonelectrical energy, price-induced energy conservation, and substitution of energy forms. Liquid-metal-cooled fast breeders are assumed as the nuclear power workhorse in the scenario R D V

**A77-42740** Energy reduction in cleaning exhausts containing particulates and noxious gases S V Sheppard and W L Klugman (Ceilcote Co, Berea, Ohio ) (*American Society of Heating, Refrigerating and Air-Conditioning Engineers, Semiannual Meeting, Chicago, Ill, Feb 13-17, 1977* ) *ASHRAE Transactions*, vol 83, pt 1, 1977, p 625-633, Discussion, p 634

This paper reviews the different types of gas cleaning equipment in terms of energy consumption and focuses upon new equipment designs which are capable of giving greater collection efficiency at lower energy uses. Newer designs which will be evaluated are wet scrubbers using electrostatic augmentation, crossflow packed scrubbers using flux forces and condensation, and scrubbers using waste thermal energy. These are energy efficient scrubbers that in many applications can operate at hydraulic power of less than 3 hp per 1000 ACFM (13 w per 10 cu m/hr) and give good removal efficiencies on particles having an aerodynamic cut diameter of 2 microns and smaller and extending into the submicron range. An example showing a comparison of first costs and annual costs of

operating scrubbing systems required to give cleaned air meeting environmental protection requirements and hygienic threshold limits will also be included (Author)

**A77-42741 Thermal storage - It saves and saves and saves** R T Tamblin (Engineering Interface, Ltd, Willowdale, Ontario, Canada) (*American Society of Heating, Refrigerating and Air-Conditioning Engineers, Semiannual Meeting, Chicago, Ill, Feb 13-17, 1977*) *ASHRAE Transactions*, vol 83, pt 1, 1977, p 677-684, Discussion, p 685, 686

It is pointed out that thermal storage can be a powerful energy conservation tool which can minimize the cost of energy in three ways related to the saving of fuel, the reduction of electric cooling demand, and the reduction of electric utility investment. The cost of committing waste heat to storage may be less than one-quarter of the energy required for the generation of new heat. Attention is given to the cost of thermal storage, the expansion of a central chilled water plant, financial considerations regarding the storage for a new commercial building, questions of thermal location, aspects of thermal storage interconnection, and thermal storage problems. G.R

**A77-42784 \* # The aircraft energy efficiency active controls technology program.** R V Hood, Jr (NASA, Langley Research Center, Hampton, Va) In *Guidance and Control Conference*, Hollywood, Fla, August 8-10, 1977, Technical Papers

New York, American Institute of Aeronautics and Astronautics, Inc., 1977, p 279-285 9 refs (AIAA 77-1076)

Broad outlines of the NASA Aircraft Energy Efficiency Program for expediting the application of active controls technology to civil transport aircraft are presented. Advances in propulsion and airframe technology to cut down on fuel consumption and fuel costs, a program for an energy-efficient transport, and integrated analysis and design technology in aerodynamics, structures, and active controls are envisaged. Fault-tolerant computer systems and fault-tolerant flight control system architectures are under study. Contracts with leading manufacturers for research and development work on wing-tip extensions and winglets for the B-747, a wing load alleviation system, elastic mode suppression, maneuver-load control, and gust alleviation are mentioned. R D V

**A77-42854 Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif, May 12, 13, 1976, Proceedings** Symposium sponsored by the Peninsula Professional Societies *Water, Air, and Soil Pollution*, vol 7, Feb 1977 139 p

Attention is given to possible solutions to the United States energy dilemma, the effects of restricting the availability of nuclear energy, the prospects of renewable energy sources, and a methodology for the implementation of energy saving technologies. Also considered are the alternative roles of transportation in urban planning, the augmented ingestion of carbon monoxide and sulfur oxides by occupants of vehicles while idling in drive-up facility lines, and the Modular Integrated Utility System as a potential influence on community development. B J

**A77-42855 The United States energy dilemma - How can we solve it** G R Hill (Electric Power Research Institute, Palo Alto, Calif) (*Peninsula Professional Societies, Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif, May 12, 13, 1976*) *Water, Air, and Soil Pollution*, vol 7, Feb 1977, p 141-146

The basis for the present energy dilemma is described. The current solution to the inadequate petroleum and natural gas supplies and possible long-term solutions are developed. Current efforts within ERDA and by industry and the public to help solve the problem are considered. An important element in solving the problem is the establishment of platforms where effective dialogue can be developed between those concerned with the environment and those trying to produce energy. There the necessary tradeoffs can be discussed and an action plan developed. Finally, possible

mechanisms for moving toward energy independence are suggested (Author)

**A77-42856 Patterns of energy use and the critical choices ahead** S O Blois (Pacific Gas and Electric Co., San Francisco, Calif) (*Peninsula Professional Societies, Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif, May 12, 13, 1976*) *Water, Air, and Soil Pollution*, vol 7, Feb 1977, p 147-164

Patterns of contemporary and projected energy use in the US are presented with attention to the industrial, commercial, residential, and agricultural sectors. The patterns in northern and central California are compared with national patterns. Factors that could modify the projected patterns are discussed, and attention is directed to end-use applications. It is suggested that, in the immediate future, coal and conventional nuclear power will be used more than at present as sources of energy. M L

**A77-42857 Some impacts of restricting nuclear energy availability** J B Kopelman and D M Nesbitt (Stanford Research Institute, Menlo Park, Calif) (*Peninsula Professional Societies, Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif, May 12, 13, 1976*) *Water, Air, and Soil Pollution*, vol 7, Feb 1977, p 165-174 6 refs

Although the present average costs of generating electricity from nuclear reactors are less than the average cost of power from fossil fuel plants, the pressures for additional regulatory controls on nuclear power plants raise the possibility that nuclear power might become unavailable as an energy alternative. With the help of a model of US interfuel competition developed at SRI, some of the implications of various alternative assumptions about the future availability of nuclear power are examined. The economic costs of a nuclear moratorium are evaluated for two different forecasts of energy demand growth. Although the loss of the nuclear option is offset by a substantial increase in eastern and western coal production, the net cost of this replacement over 20 billion dollars annually by 2000 - is substantial (Author)

**A77-42858 The prospects for renewable energy sources** J G Witwer (Stanford Research Institute, Menlo Park, Calif) (*Peninsula Professional Societies, Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif, May 12, 13, 1976*) *Water, Air, and Soil Pollution*, vol 7, Feb 1977, p 175-180 6 refs

As the reserves of depletable fuels are consumed, their prices will increase, thus making renewable energy sources more cost competitive. SRI has evaluated the potential uses for and costs of renewable energy sources and compared them with other energy sources currently being utilized. These economic estimates serve as a basis for discussing the possible contribution that solar energy sources can make to the US energy system. Some of the technical, environmental, and institutional problems associated with each of these solar energy forms are reviewed (Author)

**A77-42859 Evaluation of energy policy** L S Windheim (Leo A Daly Co., San Francisco, Calif) (*Peninsula Professional Societies, Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif, May 12, 13, 1976*) *Water, Air, and Soil Pollution*, vol 7, Feb 1977, p 181-185 11 refs

An energy strategy of doing more with less is urged on the grounds that it would provide more jobs, less inflation, and less pollution. The importance of conserving energy used by buildings is stressed, with attention to the role of the architect in energy conservation. Energy policies are considered with reference to the concept of entropy. Energy from the sun is said to provide a limited store of low entropy high energy fuels, and an abundance of higher entropy but continuing current energies. M L

**A77-42860 Future energy options, ethics and a case for conservation** J E Armstrong (*Peninsula Professional Societies,*

*Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif., May 12, 13, 1976)* *Water, Air, and Soil Pollution*, vol 7, Feb 1977, p 187-194

Up to 1990 the U S must rely upon four major sources for additional energy to meet the expected continued growth in energy use (1) expanded coal and the associated synthetics fuels derived from it, (2) expanded production of continental shelf and Alaskan oil and gas, (3) nuclear, and (4) imported petroleum After 1990, solar and oil shale could play increasingly important roles as additional sources These major energy options will be compared at a national level in their broad environmental, economic, social, and political implementation impacts, with special emphasis on major effects of economic soundness, employment, food supply, national defense, and the emerging social unrest which characterizes the 1970s in the U S A It is concluded that a major energy conservation program would be a prudent course for the U S A to follow, with the stipulation that its gradual implementation over something like a 10 year time period is necessary (Author)

**A77-42891 Compact shrouds for wind turbines** O Igra *Energy Conversion*, vol 16, no 4, 1977, p 149-157 5 refs Research supported by the U S-Israel Binational Science Foundation

As part of a large project aimed at finding the optimal configuration for an aerogenerator to exploit wind power, an investigation was launched to find the most compact shroud possible The dominant contributor to the shroud length is the structure downstream of the turbine (the diffuser) This component has an ever increasing cross-section as one progresses downstream, however, fast rate of area divergence will cause flow separation and the significant reduction in output power associated with it It is the purpose of the present paper to demonstrate ways to overcome this difficulty This can be achieved either by proper diversion and introduction of the shroud's external flow into the diffuser's inner boundary layer or alternatively, by the usage of a ring-flap (Author)

**A77-42892 Radiation effects on high efficiency silicon solar cells** W. Luft (TRW Defence and Space Systems Group, Redondo Beach, Calif) *Energy Conversion*, vol 16, no. 4, 1977, p 159-167 17 refs

The performance of ten silicon solar cells currently in production was evaluated The cells represented several types enhanced cells (Ta<sub>2</sub>O<sub>5</sub> coating), hybrid cells (shallow junction/high grid density), field cells (P+ back surface field, attributes of hybrid cells), black hybrid cells (hybrid cells with low reflective surfaces) and black field cells (field cells with low reflective surfaces) A previously described (Luft, 1974) solar simulator with an estimated error of less than 3% was used in the evaluations The initial efficiencies of the cells tested ranged from 10.3 to 13.6% after prolonged illumination The cells appeared to have a small photon degradation Although the initial efficiency of the cells tested was up to 39% higher than that of conventional cells, their performance was more severely degraded by irradiation by 1-MeV electrons to a fluence of ten to the fifteenth electrons per square centimeter The highest degradation in each resistivity group was found in field cells All cells except for a cell group using float-zone material showed annealing of electron irradiation damage of up to 5% C K D

**A77-42893 The spacing of wind turbines in large arrays.** B G Newman (McGill University, Montreal, Canada) *Energy Conversion*, vol 16, no 4, 1977, p 169-171 6 refs

The effect of spacing on the power output of wind turbines in large arrays has been determined theoretically Following Templin, the effect is assessed by determining the increase in roughness of the earth's boundary layer due to the drag of the turbines The thickness of the boundary layer is assumed to change in proportion to the square root of the skin friction, which is appropriate for a turbulent Ekman layer, and differs from the assumptions made by Templin The loss of power for both flat-open country and rough-wooded country is determined as a function of the area density of the turbines, and it is found that quite large spacings are required to avoid a significant loss of power (Author)

**A77-42894 Ionization instability in non-equilibrium MHD generators.** M S Sodha, S C. Kaushik, R P Sharma, B K. Gupta, and B K Sawhney (Indian Institute of Technology, New Delhi, India) *Energy Conversion*, vol 16, no 4, 1977, p 173-180 13 refs. NSF-Navy-supported research

The growth rate of ionization instability has been investigated using the phenomenological and semi-kinetic approach and taking the temperature/velocity dependence of collision frequency into account For the semi-kinetic treatment, the Boltzmann Transfer Equation has been used taking into account the velocity dependence of collision frequency The electron collision frequency is assumed to be a power law function of the electron temperature or velocity. The exponent governs the behavior of the scattering mechanism. In both cases the dependence of electron collision frequency on electron temperature/velocity has a stabilizing effect on the growth rate of ionization instability in weakly ionized plasmas of interest in MHD generators (Author)

**A77-42895 Solar power systems** J C Denton (Energy Associates, Belton, Tex) *Energy Conversion*, vol 16, no 4, 1977, p 181-198 18 refs

A review of the principal solar power systems is presented The nature of the solar energy source is discussed starting from the energy output of the sun and covering briefly the important atmospheric effects to characterize the available solar energy on the earth's surface The various methods for capturing solar energy are presented flat-plate, concentrating, photovoltaic, and other collectors Energy storage methods are presented briefly for thermal, chemical, electrical, and mechanical storage approaches An application of solar power systems in interaction with a conventional electrical utility system is presented in terms of mode of operation (base, intermediate, and peaking), reliability, capacity displacement, and energy displacement An economic evaluation of selected solar power systems compared to conventional electrical generation plants is presented Conclusions are drawn as to the conditions under which solar power systems may become economically competitive A preliminary indication of market capture potential is discussed (Author)

**A77-42896 Economic analysis of solar total energy systems** J C Denton (Energy Associates, Belton, Tex) *Energy Conversion*, vol 16, no 4, 1977, p 199-204

An economic analysis of a solar total energy system is provided on basic investment analysis principles Assumptions and simplifications of procedure are stated Assuming that the technology becomes technologically mature in 1990, the first system built (of the type analyzed) is anticipated to have a net present value just over \$53 million based on a 25 yr economic lifetime and forecasted values for inflation rate, energy escalation rate, cost of capital, cost of operations, cost of maintenance, depreciation, construction time, costs of gas and electricity, and capital cost A specific case is analyzed Error and sensitivity analyses are not included (Author)

**A77-42897 A simplified technique for determining the boundary layer voltage loss in MHD generators** R C Dolson and O Biblarz (U S Naval Postgraduate School, Monterey, Calif) *Energy Conversion*, vol 16, no 4, 1977, p 205-211. 22 refs USAF-supported research

MHD generator performance predictions require an accurate determination of the voltage losses in the channel, however, most techniques for determining these losses need substantial calculations and/or computer storage space This paper proposes a simplified method for calculating the ohmic boundary layer contribution to the overall voltage losses Voltage drop regions are discussed and a description of the turbulent boundary layer contribution is derived Appropriate simplifying assumptions on the basic transport and MHD concepts are used to express the conductivity as a function of temperature only Weighting functions for averaging the resistivity in turbulent boundary layers are determined and the nature of these functions is presented Our results are compared with more precise descriptions and with experimental results. (Author)

**A77-42898** Economic competitiveness of windmills E E Lapin (Aerospace Corp., Los Angeles, Calif.) *Energy Conversion*, vol 16, no 4, 1977, p 213-220 9 refs

The conditions under which windmills become competitive with the generation of electric power from fossil fuels are examined. The influence of cost of construction, financing arrangements, and the future cost of fuels is shown. Energy storage and network arrangements for mills are considered briefly, as are alternate uses for mills, e.g., the utilization of mill output directly for heating or for the production of a fuel. (Author)

**A77-42954** Design of pointed solar concentrators (Conception des concentrateurs solaires pointés) R Zaharia (Centre National d'Etudes Spatiales, Paris, France) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 1, 1977, p 23-30 In French

The concept of geometrical concentration, as understood in this paper, being specified, a comparison is made between two kinds of mirrors, when combined with plane absorbers: mirrors with parabolic profile and mirrors with circular profile. The influence of various geometrical aberrations being enlightened, the case of the circular cylinder linked to a defocused plane absorber is discussed. A review is made of the results and how they compare with the usual case of the parabolic cylinder linked to a pipe shaped absorber. Some guidelines for the design of thermal collectors including linear concentrators are given. (Author)

**A77-42955** Optical performance of fixed zenith-moving azimuth parabolocylindrical concentrator I A Sakr, S H Soliman, and N H Heina (National Research Centre, Cairo, Egypt) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 1, 1977, p 31-39 12 refs

A study has been made on the parabolocylindrical concentrator whose central line is inclined to the horizontal with an angle of 30 deg. It can move in the azimuthal direction only. Theoretical equations have been derived to give the angle of incidence and the effective area of the concentrator over the whole year. The effect of input energy, ambient air temperature on the performance of the concentrator is shown by graphs. (Author)

**A77-42956** Optimum design of a single slope solar still in Riyadh, Saudi Arabia A A M Sayigh and E M A El Salam (Riyadh, College of Engineering, Riyadh, Saudi Arabia) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 1, 1977, p 40-44 12 refs

The performance of seven reinforced-concrete solar stills in Saudi Arabia was compared. The stills varied with respect to thickness of glass cover, cover slope, absorbant materials, and sealing agent between the glass cover and the frame. Absorbant materials were red sand, black sand, straw, black dye, and charcoal. A still with 20-deg slope cover gave best performance. This still was tested with different absorbants, and the use of black stone yielded highest output. This still yields 15 liters/day and its yearly average efficiency is 45 percent. P T H

**A77-42957** Study of thermal performance of solar heating systems with storage and auxiliary heaters. L Fantini and C Pisoni (Genova, Università, Genoa, Italy) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 1, 1977, p 45-52 7 refs. Research supported by the Consiglio Nazionale delle Ricerche

The thermal behavior of a solar heating system with storage and auxiliary heaters was analyzed with reference to variable thermal outdoor conditions. The analysis was carried out through a computer simulation which enables to investigate the effect on the system performance of several design parameters. In this analysis a particular storage unit of fusible solid mass was assumed and the heat capacity of the building and its effect on delaying the changes in interior temperatures was considered. The use of the program is illustrated, and the results presented show the effect on the system performance of the collector area and storage capacity. (Author)

**A77-42958** Solar heating for a sports complex in Belgium (Chauffage solaire d'un centre sportif en Belgique) G G Descy, A Grosfils, Ch Heusquin, and M Vangysel (Société d'Etudes ATRAC, Brussels, Belgium) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 1, 1977, p 53-58 In French

A solar thermal system to heat a large building complex has been studied. More than 2500 sq m of plate collectors are planned. A computer model has been created. This model takes into account all the thermal loads and energy sources. This simulation is based on typical years with true hourly meteorological data based on a statistical study over 18 years in Belgium. The results give previsional energy balance and show that 57 percent of global thermal loads are assumed by solar collectors. (Author)

**A77-42959** The geometry of catoptric light II - An application to solar energy (Catoptrique geometrique application à l'énergie solaire II - Répartitions énergétiques dans les capteurs catoptriques) L Aiache and E-F Jaguaribe (Aix-Marseille III, Université, Aix-en-Provence, France) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 2, 1976, p 4-10 18 refs In French

Photometric analysis of catoptric solar collectors is reviewed, with the aim of developing a description of the energy-gathering capabilities of solar collectors. The reception and reflection of optical and thermal fluxes from an extended light source are discussed for the case of a plane collector. To account for energy losses due to reflectance which may occur in photochemical collectors, the Fresnel reflection formula is introduced. Limitations of the monochromatic plane wave model for describing incident solar energy are also cited. Several methods for determining collector efficiency which do not involve the integrations used in conventional photometric analyses are given. These simplified techniques, which rely on graphical analysis of cones, are relatively general methods (i.e., are applicable to cases other than that of the parabolic mirror collector). Means of including the variability of the energy source (the sun) in the analysis are also mentioned. J M B

**A77-42961** A tubular evacuated solar collector utilizing a heat pipe as absorber U Ortabasi (Corning Glass Works Research and Development Laboratories, Corning, N Y) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 2, 1976, p 14-17 Contract No E(11-1)-2608

A heat pipe evacuated tubular solar collector has been built and tested. Based on the present design, it performs somewhat less efficiently than a flat plate in a vacuum for temperatures less than 125 F. However, its performance is less dependent on the temperature of operation so that it performs better at temperatures greater than 125 F. Improvements may be possible given better mirror fabrication, heat pipe design, and antireflection coatings. (Author)

**A77-42962** Studies into reduction of radiative heat losses of flat plate solar collectors P Brennecke and E Justi (Braunschweig, Technische Hochschule, Braunschweig, West Germany) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 2, 1976, p 18-24 10 refs

Flat-plate solar collectors are discussed, with attention given to cover materials and design modifications that minimize heat loss, especially radiative losses. Absorption spectra and radiative emittance are determined for several commercially-available cover materials, these data, together with information on the physical characteristics of the materials, furnish criteria for the selection of suitable covers for flat-plate collectors. Experiments are carried out to measure the efficiency of various cover materials in water-heating collector systems. A flat-plate solar collector having two plates with a trapped layer of fluid in between is also described. Whether or not the trapped fluid is circulated into the main collection chamber, the double-cover design is found to increase collector efficiency under specific conditions. J M B

**A77-42963** Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern

France (Bilan énergétique d'un ensemble capteurs-stockage inter-saisonnier pour un îlot pavillonnaire situé dans le nord de la France) R Torrenti, R. Bomal (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Saclay, Gif-sur-Yvette, Essonne, France), and G Alexandroff *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 2, 1976, p 30-33 In French

**A77-42964** Stratified density solar collection ponds - Physical factors, results of previous investigations, and suggested experiments (Lagunes solaires à stratification de densité - Eléments physiques, résultats antérieurs, projet d'expérimentation) J-L Hyacinthe (Centre Nationale d'Exploitation des Océans, Brest, France) *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, no 2, 1976, p 37, 38 In French

**A77-43009** Desulfurization of coal by use of chemical comminution P H Howard and R S Datta (Syracuse Research Corp., Syracuse, N Y) *Science*, vol 197, Aug 12, 1977, p 668, 669 11 refs ERDA Contract No 14-32-0001-1777

Chemical comminution consists of the treatment of coal with a chemical (usually ammonia gas or a concentrated aqueous ammonia solution) Selective breakage of the coal occurs which apparently takes place along the maceral boundaries and other deposits within the material such as pyrite bands A description is given of investigations which show that selective breakage by chemical comminution can be used to desulfurize coal without excessive size reduction and without creating large amounts of fines G R

**A77-43011 #** Wave power K Hulls (New Zealand Electricity Department, Wellington, New Zealand) *New Zealand Energy Journal*, vol 50, Apr 25, 1977, p 44-48 9 refs

The amount of energy potentially available to New Zealand through the use of wave power systems is examined It is estimated that the mean power level for New Zealand is 35 kW per meter of wave front, the energy flow in 63 km of wave front is equivalent to the electrical energy consumption in New Zealand at present Assuming a conversion efficiency of 35% for wave-power devices, about 250 km of coastline would receive an energy flow sufficient to meet present energy needs Seven major problem areas requiring attention before large-scale wave-power devices can go into production are identified and discussed These include conversion devices, generation, mooring, structural loading, possible adverse environmental effects, the lack of sufficient wave data, and undersea power transmission A chart of the average wave power in different locations around the world is provided C K D

**A77-43025** Calcite-aragonite deposition in geothermal wells R James (Department of Scientific and Industrial Research, Taupo, New Zealand) *Geothermal Energy*, vol 5, July 1977, p 18-24, 26-28.

Operation of geothermal wells in the Kizildere (Turkey) geothermal field is discussed, with attention given to problems of calcium carbonate deposition in the boreholes and the introduction of a heat-exchanger to make efficient use of the relatively low temperature (200 C) of the reservoir fluid Rate and composition of the deposits, which are in the form of calcite or aragonite, are studied Lower rates of deposition are obtained as pressure in the bore increases, a pressure level above 10 bars is found to induce a relatively low amount of deposition, which, however, may be more difficult to remove Design and operation of the heat exchanger are described, and its heat transfer rate, as well as the rate of deposition in its components, is monitored Cooling of the well fluid is responsible for eliminating deposition, due to retrograde solubility of the calcium carbonate in cooler water J M B

**A77-43049** Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors (Theoretische Untersuchungen über den Einfluss des Kanalabstandes auf den Wirkungsgrad von Aluminium-Flachkollektoren). S Honisch and E Behm (R und G Schmöle

Metallwerke, Menden, West Germany) *HLH - Zeitschrift für Heizung, Lüftung, Klimatechnik, Haustechnik*, vol 28, July 1977, p 253-256 In German

**A77-43070** Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator B A Swartz, T Cole, and A H Zewail (California Institute of Technology, Pasadena, Calif) *Optics Letters*, vol 1, Aug 1977, p 73-75 12 refs

Experiments are described illustrating enhanced photon trapping and efficient energy transfer in mixed-dye planar concentrators containing, for example, Rhodamine 6G and Coumarin 6 These concentrators intercept more of the solar spectrum to give an enhanced photon-flux gain that exceeds the single-dye concentrator It is also shown that the energy absorbed by the donor dye is transferred efficiently into the emitting acceptor by two competing processes (Author)

**A77-43093 #** Mathematical method for determining reaction networks in chemical systems (Matematicheskii sposob opredeleniya reaktsionnykh setei v khimicheskikh sistemakh) I Nemes, T Vidotsi, L Botar, and D Gal (Magyar Tudományos Akadémia, Kozponti Kémiai Kutató Intézet, Budapest, Hungary) *Archiwum Termodynamiki i Spalania*, vol 8, no 1, 1977, p 43-48 In Russian.

An exact algorithm is presented for determining the reaction network in a complex chemical system The method is illustrated by an example involving the partial oxidation and the parallel pyrolysis of methane in a flame at a temperature of 1500 K and a pressure of 2-3 atm for the purpose of obtaining acetylene and a synthesis gas Thirty-two elementary reactions are considered, with CH<sub>4</sub>, HCHO, CO, CO<sub>2</sub>, H<sub>2</sub>O, C<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>2</sub>, and C<sub>2</sub>H<sub>6</sub> as stable reactants, and O, H, OH, CHO, CH<sub>3</sub>, and CH<sub>2</sub> as unstable radicals B J

**A77-43119** Elimination of current concentration due to Hall effect by variable resistive electrodes M Numano (Kyoto University, Kyoto, Japan) *Plasma Physics*, vol 19, Aug 1977, p 777-783 6 refs

This paper deals with a theoretical investigation on elimination of current distortion caused by the Hall effect in Faraday-type MHD power generators Taking as an example an MHD generator with a pair of electrodes opposed and applying the conformal transformation technique to the generator channel, it is shown that the excessive current concentration at the electrode edges due to the Hall effect can be completely eliminated by adopting suitably variable resistive electrodes and that the current distribution in the generator channel is not influenced by the Hall effect This method is based on the principle that the induced Hall field is exactly compensated by the potential gradient produced by the current flow in the resistive electrodes The internal resistance of the generator is also calculated, and it is found that when the Hall parameter is large, the internal resistance is not so different from that of the generator with perfectly conductive electrodes This method is also applicable to generators with a different configuration (Author)

**A77-43123** Wind energy - Bounty in the breeze. C E Wise *Machine Design*, vol 49, Aug 11, 1977, p 20-22, 24-26

Wind-generated power is discussed, and development programs for several generator systems are reviewed Limitations on the wide-scale use of wind-generated power, including the variable availability of the energy source and the inherently low power-conversion coefficient of wind-energy systems, are considered estimates of the role of wind-energy in future U.S. energy consumption are given A number of wind-operated electrical generators having power ratings of 100 kW to 2.5 MW are described It is noted that the high capital costs of large systems may restrict their development J M B

**A77-43143** An engineering, geological and hydrological environmental assessment of a 250 MMSCFD dry ash Lurgi coal gasification facility M H Somerville, J L Elder, and S R Moran (North Dakota University, Grand Forks, N Dak) *Energy Communications*, vol 3, no 4, 1977, p 317-342 18 refs



A preliminary engineering, geological, and hydrological environmental assessment of a proposed 250 MMSCFD dry ash Lurgi coal gasification facility is discussed. The emission spectrum is examined on the basis of the proposed design and empirical data. The system examined utilizes approximately 13 million tons of lignite and 17,000 acre feet of water per year and consumes 6500 tons of oxygen per day. Results of the study indicate that the major gaseous effluent is CO<sub>2</sub>, that the federal limits on SO<sub>2</sub> effluent may be met, and that the atmospheric degradation criterion will be the most difficult one to meet. Preliminary data indicate that the majority of the trace elements will be concentrated in and leave the system with the ash. The probable hydrological and geological impacts pertinent to ash and sludge disposal and water table depression are discussed. It is probable that the water table will be depressed during mine operations and that some groundwater pollution will occur due to waste disposal. (Author)

**A77-43144** A two-stage forecasting methodology for developing a national energy policy. T. J. Murray (Missouri-St. Louis, University, St. Louis, Mo.) and Y. Omurtag (Missouri-Rolla, University, Rolla, Mo.) *Energy Communications*, vol. 3, no. 4, 1977, p. 407-427. 24 refs.

The problem of formulating a national energy policy is discussed. A review of the more common forecasting techniques, including regression techniques, time series analysis, spectral analysis, smoothing techniques, and S curve techniques leads to the conclusion that none completely meets the requirements for long-term energy planning. A two-stage forecasting approach is suggested. The first stage uses traditional forecasting models and techniques to generate quantitative and qualitative information which is integrated in the second stage using the Delphi technique. C. K. D.

**A77-43333** # Energy aspects of VTOL aircraft in comparison with other air and ground vehicles. W. Z. Stepniowski. *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 2nd, Bückeburg, West Germany, Sept 20-22, 1976, Paper 23* p. 12 refs.

VTOL and rotorcraft are compared to alternate forms of cargo/passenger transportation in terms of total flight time and total fuel needs in the aggregate, specific impulse, weight/equivalent drag ratio, weight/seat-available ratio, energy/passenger seat and energy/passenger-mile ratios, and load factors. Ways of improving fuel use in flight and hover are surveyed, and the TH-100 tandem passenger helicopter concept is examined. Indirect fuel and energy consumption (in manufacturing of vehicles, maintenance of ways/roads, repair) is taken into account in the comparisons. Optimizations of energy consumption and direct operating cost are illustrated. Advantages of rotorcraft in agriculture, police patrol, forestry, rescue, and oil-rig support are noted, but attention is drawn to the trend of oil-rig location further offshore at distances where helicopter effectiveness and reliability diminish. R. D. V.

**A77-43392** \* # New options for satellite power systems (SPS). G. M. Hanley (Rockwell International Corp., Space Div., Downey, Calif.) *AIAA, EEl, and IEEE, Conference on New Options in Energy Technology, San Francisco, Calif., Aug 2-4, 1977, AIAA Paper 77-1028* 7 p. 7 refs. Contract No. NAS8-32475.

The operation of a satellite power system (SPS) involves the conversion of solar energy into electrical energy with the aid of facilities carried by a geosynchronous satellite, the transmission of the obtained energy to earth in the form of microwave radio frequency energy, and the conversion of the energy received on earth into dc current for distribution into the network. Attention is given to questions concerning suitable microwave radiation density, details of space transportation for the construction of the SPS, and suitable approaches for the transformation of the solar energy into electric energy. It appears that a Rankine cycle using cesium as the main working fluid and a steam bottoming cycle might have advantages over a Brayton cycle concept considered earlier. In the area of solar photovoltaic concepts GaAlAs cells have advantages over silicon cells related to lighter weight, efficiency, and resistance to space radiation. The required amount of gallium seems to become available. G. R.

**A77-43399** National Airlines Fuel Management and Allocation Model. D. W. Darnell (National Airlines, Inc., Miami, Fla.) and C. Loflin. *Interfaces*, vol. 7, Feb 1977, p. 1-16.

The Fuel Management and Allocation Model determines the optimal strategy for fueling aircraft and can be used to support both short and long-term planning. It has been used operationally by the Fuels Management and Flight Control Departments of National Airlines for over two years, resulting in multi-million dollar savings. The model specifies the best fueling station and vendor for each flight, based on prices, availability, fuel burn, flight data, and cost of tankerage. The model also uses extensive sensitivity analysis techniques to alert management as to when a new policy may be required. (Author)

**A77-43522** Control of air pollution sources. J. M. Marchello (Maryland, University, College Park, Md.) New York, Marcel Dekker, Inc. (Chemical Processing and Engineering Volume 7), 1976. 638 p. 282 refs. \$49.50.

Aspects of air quality management are investigated, taking into account ambient air quality, monitoring and models, emission regulations, control methods, and environmental impact. Attention is given to pollutant dynamics, pollutants in the atmosphere, particulate control equipment, gaseous pollutant control, control systems for energy conversion, control systems for manufacturing, and the costs of air pollutant control. Problems of sampling and measurement are also discussed, taking into account ambient air sampling, gas flow measurement, stack sampling, particulate matter, sulfur dioxide and sulfides, photochemical oxidants, carbon monoxide, hydrocarbons, nitrogen oxides, and odors. G. R.

**A77-43556** On the theory and solar application of inductive grids. R. C. McPhedran (Sydney, University, Sydney, Australia) and D. Maystre (Aix-Marseille I, Université, Marseille, France). *Applied Physics*, vol. 14, Sept 1977, p. 1-20. 33 refs.

A brief description is given of the rigorous formalism of Chen (1970), which describes diffraction by perfectly-conducting inductive grids. The formalism is used to prove several general properties of grids, including the relevant form of the reciprocity theorem. The theory is used to investigate the equivalent-circuit model proposed by other authors for thin grids and also to derive a monomodal model of the type first proposed by Chen. The latter model is shown to be useful even in the region where more than one spectral order propagates. The accuracy of the formalism is established by comparison of calculated results with a number of far-infrared measurements on grids. The use of grids as solar-selective elements is investigated. They are shown to be capable of providing a/e ratios of the order of 30-40, provided that they are always pointed towards the sun and the diffuse content of the illumination is low. (Author)

**A77-43566** Energy supply of the Federal Republic of Germany (Energieversorgung der Bundesrepublik Deutschland). W.-J. Schmidt Kuster and H.-F. Wagner (Bundesministerium für Forschung und Technologie, Bonn, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff Chemie*, vol. 30, July 1977, p. 301-313. In German.

Attention is given to strategies for planning energy research and development programs, focusing on both primary and secondary energy demand, and considering such energy sources as coal, nuclear fission (particularly fast breeder reactor technology), solar, and new sources such as wind and geothermal energy. The problems and potentials of new energy technologies such as solar heating, coal gasification, and controlled fusion are considered with a discussion of time horizons (up to 1985 and up to 2000). The potential uses of nuclear energy are discussed in detail. B. J.

**A77-43593** # Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers. S. K. Ubhayakar, D. B. Stickler, C. W. von Rosenberg, Jr., and R. E. Gannon (Avco Everett Research Laboratory, Inc., Everett, Mass.) *Combustion Institute, Fall Meeting, La Jolla, Calif., Oct. 18-20, 1976, Paper 76-25* 27 p. 10 refs. Contract No. E(49-18)-2015.



Experimental diagnostics for determining the fraction of volatiles from entrained-bed coal gasifiers which thermally crack to condensates and low molecular weight gases are presented. These include the char diagnostic, in which the ash content in the input coal is compared with that in the solids collected in the funnel downstream of the water quench, and the gas diagnostic, in which the amount of volatiles which equilibrate with known quantities of entraining gases is determined. Results for two size-grades of Pittsburgh seam bituminous coal processed in the Avco entrained-bed gasifier are presented and analyzed. The fraction of volatiles which crack was found to increase with increased coal loading and the true volatile yield appeared to be greater for smaller particles. In addition, the amount of volatiles equilibrating with the entraining gases was found to depend strongly on the mixing characteristics of the coal-carrier stream and only weakly on the total amount produced. Volatiles not reacting with the gases crack to condensates partly within the char structure and partly in the gas phase. C K D

**A77-43651**      **Electrochemical neutralization of acid mine water** F D Sisler, F E Senftle, and J Skinner (U.S. Geological Survey, Reston, Va.) *Water Pollution Control Federation, Journal*, vol 49, Mar 1977, p 369-374. 16 refs

**A77-43675**      **Introduction to the ERDA electric and hybrid demonstration program** *Electric Vehicle News*, vol 6, May 1977, p 8-21

Excerpts from the ERDA-sponsored legislation empowering promotion of research and development work on electric and hybrid vehicles (Electric and Hybrid Vehicle Research, Development and Demonstration Act, Public Law 94-413 enacted Sept 17, 1976) are presented, with background and legislative history, and tabular data on batteries and flywheel technology. Sections on the industry as a whole, petroleum savings, potential markets, energy storage systems, technology transfer methodology, financial incentives, vehicle service and infrastructure, safety, and vehicle demonstration are included. R D V

**A77-43705**      **On the construction of plane stationary solutions of equations for nonequilibrium magnetized plasma** V I Artemov and O A Sinkevich (*Prikladnaya Matematika i Mekhanika*, vol 40, Sept-Oct 1976, p 813-822) *PMM - Journal of Applied Mathematics and Mechanics*, vol 40, no 5, 1976, p 764-774. 19 refs. Translation

A method is proposed for obtaining steady two-dimensional distributions of the electric current and electron temperature in a magnetized nonequilibrium plasma with allowance for heat conductivity and convection. The solution is obtained in the form of asymptotic expansions in a small parameter. The procedure of obtaining a zeroth approximation for the external and internal expansions is examined. The problem of the current distribution in a channel with infinite electrodes is solved as an example. V P

**A77-44052**      **Conference on Portable Power Sources in India, 1st, Calcutta, India, May 27, 28, 1976, Proceedings** Conference sponsored by the Society for Advancement of Electrochemical Science and Technology, Chloride India, Union Carbide, and Free India Dry Accumulators, Ltd. *SAEST, Transactions*, vol 11, July-Sept 1976. 138 p

Attention is given to the development of lead-acid batteries, lead oxides and their applications in secondary batteries, different varieties of manganese dioxide for dry cells, and the performance of magnesium-lead dioxide batteries. Also considered are the performance characteristics of Ni-Cd cells, rechargeable hydrogen electrodes with Ni-Ti systems in KOH solutions, a probability model for nonuniform gas porous electrodes, and the preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells. B J

**A77-44059**      **Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells** R L Seth, D M Bhat, S P Ghosh, and P N Mukherjee (Central Fuel Research Institute,

Dhanabad, India) (*Society for Advancement of Electrochemical Science and Technology, Conference on Portable Power Sources, Calcutta, India, May 27, 28, 1976*) *SAEST, Transactions*, vol 11, July-Sept 1976, p 425-430. Discussion, p 430, 431. 9 refs

The ideal pore structure of carbon electrodes required for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells is discussed from the view point of formation of a stable three phase boundary as well as the diffusion of gases through electrodes. The principles of preparation of electrodes with graded pore size in this context are discussed. The future programme of work in this field is also presented. (Author)

**A77-44060**      **Electric vehicles - A major potential contribution to solution of U.S. energy problems** V A Rydbeck (General Electric Co., Schenectady, N Y) *Electric Vehicle News*, vol 6, Aug 1977, p 4-7

The possible impact of electric vehicles on fuel use patterns and on the economy as a whole is examined. Reasons for the relatively slow development of electric vehicles in the United States are considered. The costs of owning and operating gasoline powered vehicles are compared with projected costs of electric vehicles. It is estimated that operating costs of a gasoline powered vehicle, assuming the price of gasoline to be 60 cents/gal and average mileage per gallon to be of 20.4, would be 20% higher than costs for an electric vehicle, assuming a power cost of 3 cents/kWh and battery leasing costs of \$11.00/month. C K D

**A77-44178**      **Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants** (*Inquinamento atmosferico al suolo prodotto da più camini di centrali termiche o termoelettriche di media o grande potenzialità*) R Benvenuti (Pisa, Università, Pisa, Italy) and F Giuntini (*Inquinamento*, vol 19, Apr 1977, p 53-55, 57, 59. 6 refs. In Italian)

A mathematical model for minimizing the effect of airborne pollution due to stack emissions is formulated. Two stack configurations, a linear array and a polygonal array, are treated; the calculation for the linear array is developed in detail, since it is more general and may be adapted to the polygonal case. Factors taken into account in the solution include stack height, distance between the stacks, wind direction and velocity prevailing at the site, and the amount of emissions from the stacks (the pollutant considered is SO<sub>2</sub>). Profiles showing the concentration of emitted pollutants as a function of distance from the stack array are given; maximum levels of concentration that fall below legal limits can be determined. J M B

**A77-44179**      **Catalytic action of combustion-product deposits in the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the combustion chambers and exhaust channels of thermoelectric plants** (*Azione catalitica di depositi in camera di combustione e condotto dei fumi di centrali termoelettriche ad olio combustibile nell'ossidazione di SO<sub>2</sub> a SO<sub>3</sub>*) R Tartarelli, F Morelli, P Davini (Pisa, Università, Pisa, Italy), and L Baldacci (Ente Nazionale per l'Energia Elettrica, Centro di Ricerca Termica e Nucleare, Pisa, Italy) *Inquinamento*, vol 19, Apr 1977, p 87-90. In Italian

**A77-44264**      **The influence of parameter dispersion of electrical cells on the array power output** J Bany, J Appelbaum, and A Braunstein (Tel Aviv University, Tel Aviv, Israel) *IEEE Transactions on Electron Devices*, vol ED-24, Aug 1977, p 1032-1040

Effects of the parameters of photovoltaic and chemical cells on array power output are examined; dispersion of the parameters of the not entirely identical electrical cells is taken into account. Load voltage, load current, load power, and mismatch loss (loss of power) were studied for strings or arrays of series-connected or parallel-connected cells, or a single cell. When the required number of cells in an array is determined analytically for a known cell parameter distribution, interchanges of nonidentical cells and an equivalent identical cell array becomes possible. The analysis is pursued for a large number of ideal electrochemical cells. R D V

**A77-44274** Energy conditions of welding with solar radiation A A Uglov (*Svarochnoe Proizvodstvo*, no 9, 1976, p 1,2) *Welding Production*, vol 23, Sept 1976, p 1-3 Translation

A calculation was made of the power required for welding a given material of a given thickness at a specified speed by means of a solar radiation welding device in space A general thermal balance equation is derived on the assumptions of a linear and slow-moving source, full penetration of the weld, circular weld pool with diameter equal to the weld width, which is identical on both faces, and a mean pool temperature of 1.1 times the melting temperature Heat losses by radiation and convection are taken into account The equation enables determining the required power, and for a given pool shape, one can determine the mean density of energy in the focal spot

P T H

**A77-44343 #** Air New Zealand's methods of flying the DC-10 W H Dunn (Air New Zealand, Ltd, Auckland, New Zealand) *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, Seattle, Wash., Aug. 22-24, 1977, Paper 77-1255* 8 p

The described methods are concerned with an achievement of maximum payloads and minimum fuel costs An average reduction in takeoff power to a value which is about 15 percent below the maximum power available has been obtained with the aid of a derating technique which ensures good aircraft performance safety A circular slide rule is used for all phases of flight from takeoff to landing for determining engine power setting and checking engine performance and aircraft drag Attention is given to the takeoff thrust setting, the effect of runway conditions on performance, performance margins, a method of presentation of takeoff data for individual runways, an en route climb technique, and aspects of cruise performance presentation

G R

**A77-44396** Photosynthetic solar energy - Rediscovering biomass fuels. A L Hammond *Science* vol 197, Aug 19, 1977, p 745, 746

Possibilities for using biomass as an energy source are considered, noting that biomass is potentially a renewable source of a full range of liquid and gaseous fuels for which domestic sources of their fossil counterparts are increasingly in short supply Biomass fuels discussed include wood products, gas derived from walnut shells, manure, crop residues, biomass ethanol, forest wastes, and aquatic plants Some research projects are described which involve the development of biomass gasifiers, ethanol fermentation from sugarcane and sweet sorghum, cultivation of blue-green algae and kelp as methane sources, and a proposal for a biomass refinery in which hydrogen would be produced from organic wastes with steam generated by solar heat concentrated on a boiler The extent of biomass resources in the United States and the economics of biomass energy systems are assessed

F G M

**A77-44437 #** Helicopter offshore operations. W T Kuhar and G H Quinn (FAA, Navigation Div, Washington, D C) In *National Aerospace Meeting, Denver, Colo., April 13, 14, 1977, Proceedings* Washington, D C, Institute of Navigation, 1977, p 69-71

The sale of lease sites off the U S coast and in Alaska, for oil and gas exploration and production, has resulted in a need for helicopter operations in offshore areas in instrument weather conditions Such operations require an air traffic control system and a navigation capability that will extend to 300 miles from shore, and provide guidance down to 200 feet above sea level Accuracy and reliability must be at least equal to that available with VOR-DME The overall offshore situation is described and FAA and industry efforts to meet the helicopter offshore navigation requirements are explained

(Author)

**A77-44448** Prefabricated houses with an indoor swimming pool heated by a heat pump (Fertighauser mit Hallenschwimmbad-wärmepumpenbeheizt). K Rennebeck *Elektrowärme International, Edition A - Elektrowärme im Technischen Ausbau*, vol 35, July 1977, p A206-A211 In German

A description is presented of a case in which two prefabricated houses with separate heating installations utilize jointly a well as energy source for heating and for hot-water supply The water which leaves the evaporators of the individual heat pumps is used for an air-dehumidification device in the hall containing the swimming pool In connection with the available water in the well as energy source, the heating system water-water-heat pump represents the optimal system However, a utilization of solar energy at a later time has been considered Attention is given to a diagram for determining the energy required for heating, a performance diagram for a hermetically sealed compressor, the energy balance of the heat pump during the heating cycle, the operation of the dehumidification installation, a description of the heat pump, and general application limits for heat pumps

G R

**A77-44449** Solar energy in tropical and subtropical countries (Sonnenenergie in tropischen und subtropischen Ländern) K-H Suttor (Kraftanlagen AG, Heidelberg, West Germany) *Elektrowärme International, Edition A - Elektrowärme im Technischen Ausbau*, vol 35, July 1977, p A212-A216 22 refs In German

The climatic conditions in the tropics and subtropics are examined and the characteristics of solar radiation as energy source are considered An investigation is conducted regarding the application of solar energy in tropical and subtropical regions Attention is given to a solar water pump, a multistage expansion evaporator plant, a thermodynamic solar plant with a capacity of 10 kW, and a solar absorption cooling plant Economic aspects of solar energy installations are also discussed, taking into account energy costs at the location of the installation, capital costs concerning the installation, operational and maintenance costs, and questions of efficiency and time of utilization

G R

**A77-44450** The heat pump - An approach for saving energy (Die Wärmepumpe - Ein Weg zur Energieeinsparung) H Müller (Braunschweig, Technische Universität, Braunschweig, West Germany) *Elektrowärme International, Edition A - Elektrowärme im Technischen Ausbau*, vol 35, July 1977, p A222-A229 47 refs In German

An investigation is conducted concerning the possibilities which exist to reduce the consumption of energy, taking into account the utilization of nonfossil and nonnuclear sources of energy An economic use of the considered systems depends to a large degree on the appropriate design of the heat pump which appears as a constructional element of the systems The evolution of the heat pump concept and the development of suitable heat pump designs are discussed Attention is given to heat pumps for space heating and hot-water supply applications, the industrial use of the heat pump, and fuel-saving approaches which do not require a use of heat pumps

G R

**A77-44464 \*** Construction and interpretation of a digital inertia image A R Gillespie and A B Kahle (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) *Photogrammetric Engineering and Remote Sensing*, vol 43, Aug 1977, p 983-1000 24 refs. Contract No NAS7-100

An image representing the thermal inertia in the vicinity of Pisgah Crater and Lavic Lake in Southern California has been generated from visible, near IR, and thermal images taken from aircraft Construction of the thermal inertia image required radiometric calibration and geometric rectification of the acquired images as well as registration to a topographic map The Kahle thermal model used in the construction of the thermal inertia image requires specification of albedo, topographic slope and slope azimuth, diurnal temperature range and local meteorological conditions Albedo information was derived from the visible image, digital topographic information was computed from digitized stereo aerial photographs, and thermal ranges were calculated by subtracting the predawn from the afternoon thermal image data Our computed values of thermal inertia were in close agreement with published values for similar surface materials Thermal inertia provides complementary information to conventional images of reflected solar radiation for use in lithologic mapping

(Author)

**A77-44476** Calculation of monthly average insolation on tilted surfaces S A Klein (Wisconsin, University, Madison, Wis) *Solar Energy*, vol 19, no 4, 1977, p 325-329 9 refs

Several simplified design procedures for solar energy systems require monthly average meteorological data Monthly average daily totals of the solar radiation incident on a horizontal surface are available However, radiation data on tilted surfaces, required by the design procedures, are generally not available A simple method of estimating the average daily radiation for each calendar month on surfaces directly towards the equator has been presented by Liu and Jordan (1962) This method is verified with experimental measurements and extended to allow calculation of monthly average radiation on surfaces of a wide range of orientations (Author)

**A77-44477** Validity of the isotropic-distribution approximation in solar energy estimations J V Dave (IBM Scientific Center, Palo Alto, Calif) *Solar Energy*, vol 19, no 4, 1977, p 331-333 8 refs

Results of numerical simulation are presented for the diffuse and direct energy passing through a sun-facing flat surface located at the bottom of plane-parallel models of nonabsorbing, homogeneous atmospheres Computations of the diffuse component were carried out with a high degree of accuracy, and also were carried out using the well-known isotropic-distribution approximation for the sky energy It is shown that the results obtained with the isotropic-distribution approximation are consistently smaller than those obtained with the exact procedure These two sets of results can differ by a factor 1-6 depending upon the optical characteristics of the model and the position of the sun (Author)

**A77-44478** A terrestrial solar thermal electric power system - Development of basic model system T Tanaka, S Sawata, T Tani, K Sakuta, and T Horigome (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan) (*International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif, July 28-Aug 1, 1975*) *Solar Energy*, vol 19, no 4, 1977, p 335-341 5 refs

A model of a solar thermal electric power system consisting of a cylindrical parabolic concentrator, a heat transfer circuit, and a storage type heat exchanger is described It features a selective surface on the absorber and a selective thin barrier on the glass envelope around the absorber and an automatic tracking system The system was tested under clear-sky conditions and a range of direct insolation values, and heat losses in the collector, collector efficiency, temperature distribution in the heat storage reservoir, and the time variation of temperature in the reservoir were measured P T H

**A77-44479** Autocorrelation and stochastic modelling of insolation sequences B J Brinkworth (University College, Cardiff, Wales) *Solar Energy*, vol 19, no 4, 1977, p 343-347 6 refs

The output of solar thermal systems is sensitive to variations in the solar energy input Among the important features of these variations is their sequential character, which has not hitherto been taken into account It is shown that the sequential characteristics of the daily insolation can be represented in simple numerical terms, derived from the autocorrelation functions of a straightforward stochastic model Synthetic sequences can then be generated, which match the long-term characteristics of the insolation with respect to its sequential properties, as well as to the seasonal trend and the variance of the fluctuations (Author)

**A77-44480 \*** Low-profile heliostat design for solar central receiver systems E Fourakis and A M Severson (Honeywell Systems and Research Center, Minneapolis, Minn) *Solar Energy*, vol 19, no 4, 1977, p 349-356 NASA-supported research

Heliostat designs intended to reduce costs and the effect of adverse wind loads on the devices were developed Included was the low-profile heliostat consisting of a stiff frame with sectional focusing reflectors coupled together to turn as a unit The entire frame is arranged to turn angularly about a center point The ability

of the heliostat to rotate about both the vertical and horizontal axes permits a central computer control system to continuously aim the sun's reflection onto a selected target An engineering model of the basic device was built and is being tested Control and mirror parameters, such as roughness and need for fine aiming, are being studied The fabrication of these prototypes is in process The model was also designed to test mirror focusing techniques, heliostat geometry, mechanical functioning, and tracking control The model can be easily relocated to test mirror imaging on a tower from various directions In addition to steering and aiming studies, the tests include the effects of temperature changes, wind gusting and weathering The results of economic studies on this heliostat are also presented (Author)

**A77-44481** Correlation equation for hourly diffuse radiation on a horizontal surface J F Orgill and K G T Hollands (Waterloo, University, Waterloo, Ontario, Canada) *Solar Energy*, vol 19, no 4, 1977, p 357-359 Department of Supply and Services of Canada Contract No. 11SQ-31040-4-2000

This paper presents an analysis of hourly diffuse radiation on a horizontal surface and recommends an equation to determine the hourly ratio of diffuse-to-total radiation received in a horizontal surface The results of the new correlation equation are compared with earlier equations with recommendations made as to its use with solar energy computer simulation programs (Author)

**A77-44483** Energy coradiation using the reversible ammonia reaction P O Carden (Australian National University, Canberra, Australia) *Solar Energy*, vol 19, no 4, 1977, p 365-378 25 refs

A system is described for the large scale generation of power from solar energy in which energy is transferred by means of the reversible chemical reaction  $2\text{NH}_3 \text{ yields } \text{N}_2 + 3\text{H}_2$  An array of pressed steel paraboloidal mirrors is employed, each having a focal absorber in which the endothermic forward reaction proceeds. The exothermic reverse reaction occurs at a common central plant and the heat energy recovered operates a thermodynamic power plant The reactants are transferred in small diameter steel piping at ambient temperature Storage of energy may be catered for by providing storage for the reactants The results so far of design studies are used to assess both the technical and economic viability of the complete scheme (Author)

**A77-44484** On the performance of cylindrical parabolic solar concentrators with flat absorbers D L Evans (Arizona State University, Tempe, Ariz) *Solar Energy*, vol 19, no 4, 1977, p 379-385 7 refs Contract No E(11-1)-2590

An integral relationship is developed for evaluating the intensity distribution on flat absorbers used with cylindrical parabolic solar concentrators Calculations are presented for perfect cross-section concentrators using various models, rim angles, off-axis angles and defocusing amounts Peak concentration ratios are shown to vary as the sine of the rim angle Off-axis and defocused operations are shown to result in considerable reduced intensities The effect of surface slope errors is also investigated Normally distributed surface slope errors with a standard deviation of 0.25 degree are shown to reduce peak intensities by more than a factor of 3 (Author)

**A77-44485** The effect of dropwise condensation on glass solar properties C K Hsieh and A K Rajvanshi (Florida, University, Gainesville, Fla) *Solar Energy*, vol 19, no 4, 1977, p 389-393

The thermal radiative properties of glass covered with dropwise water condensation on one side of a slab are analyzed with allowance for multiple reflections in a drop and the resulting energy attenuation Surface and bulk transmittance and reflectance were computed as a function of water droplet size and wavelength of incident radiation These properties were then integrated over the whole solar spectrum With dropwise condensation on one surface, the bulk solar transmittance of glass for a given drop size decreases about 48% while reflectance increases by a factor of 4.2 P T H

**A77-44486** Efficient, low cost, concentrating solar collectors N T. Pierce (MIT, Cambridge, Mass.) *Solar Energy*, vol 19, no. 4, 1977, p 395-400. 5 refs.

The paper discusses some new schemes for concentrating solar collectors. One concept uses a broad water tube absorber at the focal point so that the focusing requirements on the reflector are not too stringent and the reflector angle need not precisely match the solar elevation angle, enabling a simple drive arrangement. Another version is an array of reflecting collectors arranged in the form of a 'venetian blind'. Each reflector concentrates light upward to a flat water tube mounted behind a window in a pocket underneath the reflector above. Another idea features clear glass tubes filled with black liquid absorber. This and the other designs reported all had better performance curves than flat plate collectors. P T H

**A77-44487** Solar absorption by each element in an absorber-coverglass array D K Edwards (California, University, Los Angeles, Calif.) *Solar Energy*, vol 19, no. 4, 1977, p 401, 402. 8 refs. ERDA-supported research

**A77-44488** The architecture of a passive system of diurnal radiation heating and cooling K L Haggard (California Polytechnic State University, San Luis Obispo, Calif.) (*International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug. 1, 1975*) *Solar Energy*, vol 19, no. 4, 1977, p 403-406

The paper describes a passive system of thermal control tested on a one-story house in Atascadero, California. It uses water bags supported on a standard metal deck to form roof water ponds which act as solar collectors for heating and as heat dissipators for cooling. The metal deck acts as a heat exchanger and finished ceiling for the interior of the house. Thermal control is provided by movable insulation panels that cover or expose the ponds. Actual costs of the system and predicted post-prototype costs are given, and some plans for possible extension of the system for more northerly climates are discussed. P T H

**A77-44489** Comparison of predicted performance of constant outlet temperature and constant mass flow rate collectors D L Siebers and R Viskanta (Purdue University, West Lafayette, Ind.) *Solar Energy*, vol 19, no. 4, 1977, p 411-413. 9 refs.

On the basis of a mathematical model for the thermal behavior of a flat plate collector, the performance of a flat plate collector operating at a constant outlet temperature was compared with that of a flat plate collector operating at constant mass flow rate for short and long periods of operation for an identical mean bulk temperature for both collectors. For the constant-outlet-temperature collector the efficiency is greater near noon and smaller during the early morning and late afternoon hours than for the constant-flow-rate collector. Over a period of a month the useful energy gain and efficiency curves are similar for both collectors. P T H

**A77-44490** Fundamental studies on heat storage of solar energy T Tanaka, T Tani, S Sawata, K Sakuta, and T Horigome (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan) *Solar Energy*, vol 19, no. 4, 1977, p 415-419

An analytical and experimental study was made of the effect of size and thermophysical properties of storage material on the rate of temperature increase and quantity of heat stored in the material of a sensible heat storage system for solar utilization. The effects were treated as a problem of unsteady heat conduction in a hollow cylinder and a composite hollow cylinder at the centers of which a constant heat flux is supplied. P T H

**A77-44491** Lessons learned from Atlanta /towns/ solar experiment A Weinstein, R T Duncan, Jr., and W C Sherbin (Westinghouse Electric Corp., Falls Church, Va.) *Solar Energy*, vol 19, no. 4, 1977, p 421-427

An experimental large-scale solar heating and cooling system installed at an Atlanta, Georgia site is discussed. The program emphasized development of a low-cost installation from com-

mercially-available materials, a complete instrumentation system allowed for monitoring of the facility's performance. Details of the heating system's components, including the collector array, consisting of aluminized Mylar reflectors and solar collectors, and the storage tanks, pipings and fittings, are given. Problems encountered in installation of the collectors, as well as difficulties in the pumping and drain-down systems are mentioned. The high cost of pipings, fittings and valves (three times that of the collector array) was found to be a major consideration in the design of an economical system. Data on reflector performance and collector heat production indicate that the system, in operation since February, 1976, is performing at efficiencies better than those projected. J M B

**A77-44492** Spectral reflectance of TiN/x/ and ZnN/x/ films as selective solar absorbers R Blickensderfer, D K Deardorff, and R L Lincoln (US Bureau of Mines, Albany, Ore.) *Solar Energy*, vol 19, no. 4, 1977, p 429-432. 20 refs.

**A77-44497 #** Compatible building design T L Freeman (Wisconsin, University, Madison, Wis.) *Sunworld*, May 1977, p 2-6

Architectural and civil engineering considerations essential in the design and/or remodeling of a building to facilitate maximum compatibility with retrofit of an active-type solar energy heating system are discussed. Building heat losses, suitable placement of solar collector arrays, allowing for future building in of a thermal storage unit, and appropriate piping and ducting ways are dealt with. Such planning ahead on the part of building architects and builders is recommended and addressed by the article, and could go a long way toward reducing overall solar heating system costs in the future. R D V

**A77-44498 #** Wind power for India S K Tewari (National Aeronautical Laboratory, Bangalore, India) *Sunworld*, May 1977, p 7-9

The technical and economic feasibility of wind power for rural conditions in India is assessed. Early and current wind power and windmill development are surveyed, and wind measurements on record are mentioned. The relative economics of wind power and power taken from the grid (for areas where such power is accessible) are compared for rural electrification, with base prices for power and distance (of village) from grid connections taken into account. Wind data are provided for various locations in India (design wind speed for energy maximum, power density for design wind speed, windmill hours of operation based on design speed). R D V

**A77-44499 #** Selective absorbers for flat plate collectors R M Winegarner (Optical Coating Laboratory, Inc., Santa Rosa, Calif.) *Sunworld*, May 1977, p 12-14

Data and formulas are presented to assist calculations and selection of selective absorber surfaces for flat plate collectors. Formulas for absorbance, thermal (IR) emittance, amount of heat collected by a solar collector, and economic value of energy extracted as useful heat from a collector are exhibited, along with data on EM radiation regions (wavelength ranges and transmittance of atmosphere in those ranges), data for specific absorber surfaces, and US consumer prices for residential energy. Marginal analysis for decision-making on the cost effectiveness of solar energy is recommended. R D V

**A77-44522** What's holding up coal gasification. F Hirschfeld *Mechanical Engineering*, vol 99, Aug 1977, p 32-37

The development of coal gasification facilities in the US is discussed. The role of ERDA and the Federal Power Commission (FPC) in promoting and regulating the development of coal gasification is considered, problems relating to financing, environmental impact, and administrative controls are reviewed. Several pilot plants, including those that involve hydrocarbonization or the slagging Lurgi process, as well as pilot programs involving low-Btu gas production, are discussed. Synthetic natural gas, which may ultimately be a less expensive energy source than electricity generated from coal, is also held to be advantageous in that it is storable and

can be used in satisfying peak demand, and can be used in existing gas transmission and distribution systems J M B

**A77-44557** Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification P J Kern and O B Koropey (U S Military Academy, West Point, N Y ) *Society of Automotive Engineers, International Automotive Engineering Congress and Exposition, Detroit, Mich , Feb 28-Mar 4, 1977, Paper 770047* 15 p 10 refs

The reported study is concerned with the interrelationships involved when various exhaust systems are combined with the turbocharged Texaco Controlled Combustion System Two exhaust manifold configurations are studied, including a conventional cast iron manifold whose volume equals one-half the engine displacement and a thermal reactor representing a manifold of twice the engine displacement The results of the study show that a thermal reactor can provide increased energy to the turbine if the air-fuel mixture is rich enough, and heat and pressure losses are not excessive G R

**A77-44558** Design considerations on a thermal energy storage Stirling engine automobile G A A Asselman, C L Spigt, and R J Meijer (Philips' Gloeilampenfabrieken, Philips Research Laboratories, Eindhoven, Netherlands) *Society of Automotive Engineers, International Automotive Engineering Congress and Exposition, Detroit, Mich , Feb 28-Mar 4, 1977, Paper 770080* 14 p 7 refs

The external heating system of the Stirling engine enables it to be coupled to a variety of energy sources In the field of unconventional heating systems a high temperature thermal energy storage unit has been built in which, for the heat transport, use is made of the heat pipe principle Based on experience with this, design considerations are given regarding the performance of an automobile propulsion unit, for which a new concept of a Stirling engine with a variable swash-plate drive and heating by a rechargeable thermal energy storage unit are used (Author)

**A77-44559** The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report N K G Rosenqvist, S G Gummeson, and S G K Lundholm (United Stirling /Sweden/ AB and Co, Sweden) *Society of Automotive Engineers, International Automotive Engineering Congress and Exposition, Detroit, Mich , Feb 28-Mar 4, 1977, Paper 770081* 11 p 5 refs

**A77-44560** Design of the 4-215 D A automotive Stirling engine R van Giessel and F Reinink (Philips Forschungslaboratorium Hamburg GmbH, Hamburg, West Germany) *Society of Automotive Engineers, International Automotive Engineering Congress and Exposition, Detroit, Mich , Feb 28 Mar 4, 1977, Paper 770082* 15 p 5 refs

The described investigation had mainly the objective to study the capability of the Stirling engine for automotive applications A four cylinder double-acting swash-plate engine was selected because it satisfied packageability, weight, and fuel economy requirements better than other Stirling engine configurations It was found that the engine shows potential for achieving low noxious emissions excellent fuel economy, a low noise level, a performance similar to that of the untreated base-line engine, and the capability for operating on a variety of liquid and gaseous fuels G R

**A77-44563** Some UK progress in sodium sulphur technology G R Lomax (Chloride Silent Power, Ltd, England) *Society of Automotive Engineers, International Automotive Engineering Congress and Exposition, Detroit, Mich , Feb 28-Mar 4, 1977, Paper 770280* 9 p 23 refs

This paper describes some progress made in the UK on sodium sulphur cells designed for motive power applications This is an area where compatibility with vehicle design imposes design constraints on the cell The state of the art of the cell components are reviewed Most of the design problems associated with the sodium electrode have been solved Electrolyte 33 mm dia and over 500 mm long can

now be produced and the strength and conductivity can be controlled Factors controlling the rechargeability of the sulphur electrode have been studied and 90% capacity retention has been achieved for 8000 hours without any deterioration of performance A 100 Ahr cell has completed 60 charge discharge cycles without any significant deterioration of performance (Author)

**A77-44564** A new design for the high-performance sodium-sulfur battery S Hattori, M Yamaura, S Kimura, and S Iwabuchi (Yuasa Battery Co, Ltd, Takatsuki, Osaka, Japan) *Society of Automotive Engineers, International Automotive Engineering Congress and Exposition, Detroit, Mich , Feb 28-Mar 4, 1977, Paper 770281* 10 p 5 refs Research sponsored by the Ministry of International Trade and Industry of Japan

This paper describes a new design for the sodium-sulfur battery employing a new cell construction including a new method to join the solid electrolyte tube with the sodium reservoir made of metal, and an improved composition of the cell case to solve the problems of premature cell destruction and capacity decrease associated with our conventional design As a result a higher and more stable performance of the new design than that of our conventional design has been shown through various evaluation tests (Author)

**A77-44604** Recovery of energy from fracture-stimulated geothermal reservoirs A Hunsbedt, P Kruger, and A L London (Stanford University, Stanford, Calif ) *(Society of Petroleum Engineers and American Institute of Mining, Metallurgical and Petroleum Engineers, Annual California Regional Meeting, 46th, Long Beach, Calif , Apr 8-9, 1976 ) Journal of Petroleum Technology*, vol 29, Aug 1977, p 940-946 16 refs NSF-supported research

Hydrothermal energy production is investigated through laboratory experiments Topics discussed include conditions for optimum energy extraction, rock heat transfer characteristics, moving flash (boiling) fronts, reservoir pressure behavior during fluid withdrawal, the effects of cool and hot fluid recharge, and cycle production/recharge operations of fracture-stimulated hydrothermal reservoirs The experiments employ rock loadings of different porosities having characteristics that simulate those found in highly fractured regions Density stratification effects in the liquid/vapor medium are discussed, and energy extraction fractions are given for various conditions of pressure and recharge It is concluded that thermal energy stored in fracture-stimulated rock can be most effectively extracted by lowering the system pressure so that boiling is initiated within the rock reservoir J M B

**A77-44608** Comparative kinetics of high-temperature reaction between H<sub>2</sub>S and selected metal oxides P R Westmoreland, J B Gibson, and D P Harrison (Louisiana State University, Baton Rouge, La ) *Environmental Science and Technology*, vol 11, May 1977, p 488-491 11 refs U S Environmental Protection Agency Grant No R-802036

Initial rates for the reactions between H<sub>2</sub>S and MnO, CaO, ZnO, and V<sub>2</sub>O<sub>3</sub> over a temperature range of 300-800 C were determined in a thermobalance reactor All reactions were first order with respect to H<sub>2</sub>S and obeyed the Arrhenius equation The sequence MnO, CaO, ZnO, V<sub>2</sub>O<sub>3</sub> represents the relative magnitude of reaction rates determined in decreasing order MnO possessed favorable properties for a high-temperature desulfurization process, and additional research in this area is recommended (Author)

**A77-44612** Northeastern utilities are meeting the clean air challenge J J Cramer, F B Kaylor (Stone and Webster Engineering Corp, Boston, Mass ), E J Schmidt, and E R Zabolotny *Environmental Science and Technology*, vol 11, June 1977, p 556-560

The effect of the National Environmental Policy Act of 1969 and the Clean Air Act of 1970, as well as state and local regulations on the operation and expansion of utilities in the Northeastern U.S. is assessed Cases studied include conversion of coal-powered steam electric plants to oil, and the expansion of an oil-fired steam electric plant in an environmentally-sensitive area (Cape Cod, Mass ) The use of emission control equipment, such as electrostatic precipitators,

the introduction of tall and multiple-flue stack configurations, the attainment of optimal air/fuel ratios, and the use of low-sulfur fuels are considered. Climatological diffusion of SO<sub>2</sub> and the problem of sootfall are also discussed. J M B

**A77-44675** Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source. S J Davis, C F Gibbs, and K B Pugh (Marine Science Laboratories, Anglesey, Gwynedd, Wales) *Environmental Pollution*, vol 13, July 1977, p 203-215. 5 refs. Research supported by the Natural Environment Research Council.

**A77-44688** # Global problems and energy (Global'nye problemy i energiya). P L Kapitsa (Akademiya Nauk SSSR, Institut Fizicheskikh Problem, Moscow, USSR) *Uspekhi Fizicheskikh Nauk*, vol 122, June 1977, p 327-337. 8 refs. In Russian.

Processes characterized by geometric progression in amplitude and in rate of change, culminating in explosions or catastrophes, are considered in relation to global problems (population increase, energy consumption, living standards, exhaustion of natural resources - fuel and ores). The inadequacy of some renewable energy sources (solar, wind, geothermal) to meet major industrial needs is pointed out, and hazards inherent in nuclear industry (core meltdown, wastes disposal, plutonium proliferation), which could meet large-scale industrial energy needs, are discussed. Energy acquisition on a large scale via thermonuclear fusion or modifications of nuclear fission processes is considered, and energy from matter-antimatter interaction is mentioned speculatively. R D V

**A77-44690** # Analogy between thermal-convective and magnetohydrodynamic instabilities (Analogiya mezhdu teplokonvektivnoi i magnitogidrodinamicheskoi neustoiichivostiyami), la la Valdmanis and O A Kukainis *Magnitnaia Gidrodinamika*, Apr-June 1977, p 42-44. 17 refs. In Russian.

An analogy is considered between thermal-convective instability and MHD instability due to the different electromagnetic forces generated in constant as well as variable thermal and electromagnetic fields. The analogy involves the convective structure arising in fluids and gases in the presence of temperature gradients and structured motions produced in MHD systems by magnetic-field perturbations. As an example, the proposed 'bubble' instability that may arise in a variable magnetic field is examined. It is suggested that the instabilities observed during high-power operation of MHD pumps and generators might be associated with magnetic cavitation. F G M

**A77-44694** # Calculation of a three-dimensional model for a conduction MHD machine with frame-type electrodes (Raschet ob'emnoi konduktsonnoi MGD-mashiny s elektrodami ramonogo tipa). lu M Gel'fgat and L A Gorbunov *Magnitnaia Gidrodinamika*, Apr-June 1977, p 113-118. In Russian.

A finite-difference technique is outlined for computing a three-dimensional model of a channel of an MHD pump with slanted sectional frame-type electrodes. The three-dimensional nature of the electric-current distribution in the channel is taken into account, and calculations are performed for the case of a uniform velocity profile at magnetic Reynolds numbers of much less than unity. The dependence of the main MHD characteristics of the channel on electrode and channel geometry is determined. It is found that electrode impedance has a significant effect on channel efficiency. F G M

**A77-44821** # Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry. S A Self, F O Reigel, R K James (Stanford University, Stanford, Calif.), and R M Clements (Stanford University, Stanford, Calif., Victoria, University, Victoria, British Columbia, Canada) *Journal of Energy*, vol. 1, July-Aug. 1977, p. 206-211. 15 refs. NSF Grant No ENG-73-04116A01.

Methods for the determination of electron concentration are discussed as an alternative to, or a check on, measurements of electrical conductivity and temperature for characterizing plasma

properties in combustion MHD flows. In particular, the interferometric method of determining the free electron concentration is analyzed, and its potential assessed. A submillimeter laser Michelson interferometer is described and preliminary measurements of electron concentration in the free jet of the Stanford M-8 combustor are reported. It appears that accurate measurements of the path integral of electron concentration can be made which give good agreement with values calculated from Saha equilibrium at temperatures measured by the line reversal technique. A measure of the electron mobility also may be obtained, and hence the electrical conductivity may be derived by a single nonintrusive measurement technique which is applicable to ash-laden flows. (Author)

**A77-44825** # MHD combustor effluent chemistry measurements using Raman scattering. A A Boiarski and R H Barnes (Battelle Columbus Laboratories, Columbus, Ohio) *Journal of Energy*, vol 1, July-Aug 1977, p 263, 264. 7 refs.

A Raman scattering technique was used to study the chemistry of effluents (CO<sub>2</sub>, N<sub>2</sub> and H<sub>2</sub>O) at the exit plane of the CH<sub>4</sub>/air combustor of an MHD generator. The key result was that potassium seed emission from the flow does not deleteriously affect Raman spectral measurements. A gas temperature determined from the N<sub>2</sub> Raman spectrum agreed reasonably well with a computed exit flow value. The experiments indicated that Raman scattering could be a powerful tool in the study of the thermochemical state of MHD combustors. B J

**A77-44975** Symposium on Engineering Problems of Fusion Research, 6th, San Diego, Calif., November 18-21, 1975. Proceedings. Symposium sponsored by the General Atomic Co., IEEE, ERDA, and ANS. New York, Institute of Electrical and Electronics Engineers, Inc., 1976. 1278 p. \$36.

The areas considered include systems engineering, superconductors, beams and sources, magnet and coil engineering, energy storage, magnetic confinement devices, plasma and energy sources, coil design, Tokamak reactors, and switches and high voltage supplies. Attention is also given to vacuum engineering, plasma heating, stress and magnetic field analysis, fusion reactors, instrumentation and data handling, reactor coil design, large power supplies, and materials, walls and blankets. G R

**A77-45125** Acid mine drainage - The problem and the solution. J K Alderman and W M Smith (West Virginia University, Morgantown, W Va.) *Coal Mining and Processing*, vol 14, Aug 1977, p 66-68, 87, 88. 26 refs.

Acid mine drainage (AMD) in the Appalachian region, 80% of which presently originates from abandoned mines, is discussed. A history of the legislation related to AMD control in West Virginia and Pennsylvania is given, current case law suggests that mining operations that provoke AMD by disrupting the hydrology of abandoned mines may be held liable. Programs to reduce AMD, involving mine sealing, strip mine backfilling, sealing of subsidence areas and surface mine regrading, are described, and the relative cost of these techniques is evaluated. As an alternative to the conventional control methods, which are found to be increasingly expensive, mineral and metal recovery from AMD and the utilization of the by-product sludge from acid neutralization for sewage treatment or rock dust are proposed. J M B

**A77-45151** On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells. H Meier, U Tschirwitz, E Zimmerhackl, W Albrecht, and G Zeitler (Staatliches Forschungsinstitut für Geochemie, Bamberg, West Germany) *Journal of Physical Chemistry*, vol 81, Apr 21, 1977, p 712-718. 48 refs. Research supported by the Bundesministerium der Verteidigung and Fonds der Chemischen Industrie.

**A77-45228** Being prepared for future Argo Merchants J Milgram (MIT, Cambridge, Mass.) *Technology Review*, vol 79, July-Aug. 1977, p 14-27. 5 refs.

Details and circumstances of the oil spill and breakup of the Argo Merchant supertanker off Nantucket (Dec 1976) are recounted, problems in containing and dispersing oil spills are surveyed, and ecotherapeutic measures are discussed. Emergency action to deal with stricken and grounded vessels, building of stronger hulls with double bottoms, preparations for cleaning up offshore spilled oil, the behavior of oil in spills and behavior of different oils on the sea, effects of wave action on the spills, characteristics of a total spill cleanup system, and uses of barriers and skimmers are discussed. Stockpiling of barriers, skimmers, storage vessels, tow vessels and barges, and preparedness of personnel trained to deal with oil spill emergencies are recommended. R D V

**A77-45303** Silicon solar cells on zone-melted silicon/graphite substrates. T L Chu, S S Chu, K Y Duh, and H C Mollenkopf (Southern Methodist University, Dallas, Tex.) *Journal of Applied Physics*, vol 48, Aug 1977, p 3576-3579. 11 refs. NSF Grant No AER-73-07843, Contract No E(04-3)-1285.

Polycrystalline-silicon solar cells deposited on graphite substrates by conventional chemical vapor deposition techniques have low conversion efficiencies due to the carrier recombinations at grain boundaries. To reduce the concentration of grain boundaries, silicon layers deposited on graphite substrates have been zone melted to increase substantially the size of silicon crystallites. Using these silicon layers as substrates, solar cells have been deposited in a one-step process by the thermal reduction of trichlorosilane containing appropriate dopants, and AM1 efficiencies of higher than 5% have been obtained for cells of about 6-sq cm area. (Author)

**A77-45304** GaAs double-heterostructure photodetectors. J L Merz, R A Logan, A M Sargent (Bell Telephone Laboratories, Inc., Murray Hill, N.J.), and P L McBride. *Journal of Applied Physics*, vol 48, Aug 1977, p 3580-3587. 19 refs.

$\text{Al}_x\text{Ga}_{1-x}\text{As}$ -GaAs structures grown by LPE have been investigated for optical power conversion at 8500 Å. Comparison is made between single- and double-heterostructure configurations, both in theory and experiment, relative merits of each structure are discussed. Good I-V characteristics have been realized for these devices, with series resistance as low as 0.16 ohm. For small-area (5-6 sq mm) devices operating at a few mW power, fill factors between 0.75 and 0.81 and internal quantum efficiencies exceeding 90% have been achieved for each structure investigated. Power conversion efficiencies as high as 46% were obtained at 8500 Å, after correcting for reflection losses, this approaches the theoretical limit for space-charge-limited devices. The devices were also evaluated as solar batteries, with efficiencies of 13-14% reported, corresponding to internal efficiencies as high as 18%. (Author)

**A77-45307 \*** Power deposition in He from the volumetric He-3/n,p/H-3 reaction. R J De Young (Vanderbilt University, Nashville, Tenn.) and P A Winters (NASA, Langley Research Center, Hampton, Va.) *Journal of Applied Physics*, vol 48, Aug 1977, p 3600-3602. 9 refs. Grant No. NSG-1232.

Calculations are presented in this paper which show the amount of power that can be expected to be deposited in He-3 for typical direct nuclear-pumped lasers presently in use. The calculations were performed taking into consideration the cylindrical geometry of the system, the depletion of the thermal flux across the tube cross section, and the energy loss of the protons to the cell walls. If a laser efficiency of 1% is assumed, the results indicate a steady-state laser output of 12.5 kW from a volume of 152.6 cu cm or 82 W/cu cm can be achieved. (Author)

**A77-45324** Investigating the starting modes of the GT-35 gas turbine plant. G G Ol'khovskii, L V Povolotskii, M P Kaplan, A O Bumarskov, A I Belov, L I Chernomordik, and P I Korzh (Khar'kovskii Turbogeneratortnyi Zavod, Kharkov, Ukrainian SSR, Vsesoiuznyi Nauchno-Issledovatel'skii Teploekhnicheskii Institut, Moscow, USSR) (*Teploenergetika*, Aug 1976, p 57-60) *Thermal Engineering*, vol 23, Aug 1977, p 43-46. Translation.

The paper reports on the results of tests on the startup characteristics of the GT-35 gas turbine installation forming part of a steam-gas installation, and on various factors that effect the startup characteristics. The gas turbine installation is characterized by a compressor with compression ratio of 6.5-7 and by significant pressure losses in the cycle (about 16% in nominal regime). A steam turbine consisting of a double-rimmed velocity wheel rotating at the same frequency as the main turbine shaft is used for turning the shaft during startup. The trends of the turbine and compressor efficiency under various startup regimes were plotted. It was found possible to have cold turning without ignition of the fuel up to rotational frequencies of 900 rpm at startup turbine shaft power of 900-1000 kW and up to 1250-1300 rpm at 2300 kW. Power balances for these and other regimes are shown. P T H

**A77-45325** Testing the annular combustor of the NK-8 aero-engine on natural gas. A G Tumanovskii, V N Kovalev, V G Skuridin, and F M Mingaleev (*Teploenergetika*, Aug 1976, p 60-64) *Thermal Engineering*, vol 23, Aug 1977, p 47-50. Translation.

The conditions in the annular combustion chamber of a turbopump engine were studied during combustion of natural gas. The front part of the chamber consists of a block of injectors arranged in two staggered rows, forming part of the annular head of the chamber. Each injector has its own swirler and stabilizer, and air is introduced gradually into the chamber. Although one of the characteristics of ignition of natural gas in highly forced combustion chambers is the loss of combustion stability as the fuel becomes richer, rich flameout was not attained in the present experiments even at air temperature at burner inlet of 30-50°C and air velocity at inlet of 120-130 m/sec. The measurements include the burnup coefficient and temperature field characteristics as influenced by inlet conditions. P T H

**A77-45461** The utilization of solar energy in Central Europe (Sonnenenergienutzung in Mitteleuropa). K R Schreitmüller (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany) *DFVLR-Nachrichten*, July 1977, p 856, 857. In German.

The reported investigation shows that an economic utilization of solar energy under the climatic conditions of Central Europe in a number of application areas is presently already possible. However, for such a utilization, it is necessary to select the components of the considered system with care and to employ optimal dimensions. Approaches for determining optimal system dimensions are discussed, taking into account the importance of model calculations for evaluating the effect of the individual parameters. An implementation of the discussed approaches is illustrated with the aid of an example involving the use of a solar energy/oil hybrid heating system for a one-family house. G R

**A77-45499** Solar energy in Australia. R N Morse (Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia) *Ambio*, vol 6, no 4, 1977, p 209-215. 10 refs.

Solar energy research and development programs in Australia, designed to generate as much as 20% of the nation's energy needs by the year 2000, are discussed. Rates of consumption for national reserves of petroleum, coal, and natural gas, as well as for imported fossil fuels, are given for 1975 and forecast for 2000. High-efficiency solar heat generators, operating at temperatures up to 150°C, may eventually be capable of supplying 40% of the nation's heating requirements, solar water heaters for residential purposes may fill 60 to 80% of that requirement. An industrial process using solar power in the conversion of wood cellulose to ethanol, a possible substitute for petroleum-derived fuels in transportation systems, is also described. In general, energy production combining both solar power methods and conventional techniques seems likely to prevail in Australia through the year 2000. J M B

**A77-45543** Utilization of transparent heat-reflecting coatings in solar-energy converters. M M Koltun and Sh A Faiziev

(Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) (*Geliotekhnika*, no 1, 1977, p 28-31) *Applied Solar Energy*, vol 13, no 1, 1977, p 23-26 11 refs Translation.

The paper describes the optical characteristics (integrated transmission coefficient and integrated coefficient of thermal emission) of ZnS-Ag-ZnS coatings on substrates of glass and polymeric film. The coating finds application in the annealing of the radiation defects of silicon solar cells and as a heat-reflecting layer in high-voltage photoelectric converters B J

**A77-45544** Combination of focons and foclines with radiation receivers V K. Baranov (*Geliotekhnika*, no 1, 1977, p 32-37) *Applied Solar Energy*, vol 13, no 1, 1977, p 27-31 8 refs Translation

The paper describes solar collectors which operate in conjunction with focusing concentrators and focusing lenses. It is shown that binary systems consisting of focusing concentrators and lenses connected by small apertures can be used to reduce the angle of exit of rays from the system. The use of this binary system reduces the geometrical coefficient of concentration, but also reduces the angle of exit of rays from the system B J

**A77-45545** Using lasers to inspect solar-energy reflectors. R. A. Zakhidov, P. A. Panov, and V. N. Sokolov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektiro-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR) (*Geliotekhnika*, no 1, 1977, p 38-41) *Applied Solar Energy*, vol 13, no 1, 1977, p 32-34 7 refs. Translation.

The paper describes the application of laser beam diagnostics to the inspection of the accuracy of a solar reflecting surface. The system uses the LG-75 helium-neon laser at 6328 Å, with an output power of 25 mW, the collimator has amplifications of 30 and 60 times. The configuration of focal spots of separate facets of a paraboloidal collector inspected by the laser system is presented B J

**A77-45546** Paraboloid-hyperboloid concentrating systems and their accuracy. R. A. Zakhidov and A. A. Vainer (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) (*Geliotekhnika*, no 1, 1977, p 42-49) *Applied Solar Energy*, vol 13, no 1, 1977, p 35-40 10 refs. Translation

A general method is presented for calculating the distribution of the radiant vector in paraboloid-hyperboloid solar concentrating systems. An investigation of the accuracy characteristics of systems with concave hyperboloid surfaces establishes that the accuracy of such systems is almost totally determined by the accuracy of the primary mirror B J

**A77-45547** Conjugate cycles of single-loop solar power and refrigeration plants. V. A. Grilikhes, V. S. Evseev, and V. V. Chikovani (*Geliotekhnika*, no 1, 1977, p. 50-58) *Applied Solar Energy*, vol 13, no 1, 1977, p 48-51 5 refs Translation

The possibility of realizing more than one thermodynamic cycle in single circuit thermal energy systems is discussed from the standpoints of topology and thermodynamics. Attention is given to the general characteristics of using combined cycles in solar refrigerating systems with radiant energy concentrators and radiative heat transfer into the ambient medium B J

**A77-45548** Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia. A. Rakhmanov, A. Khandurdiyev, A. Kakabaev, M. Goshdzhanov, and M. Annanazarov (Akademiia Nauk Turkmenkoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR) (*Geliotekhnika*, no 1, 1977, p 59-64) *Applied Solar Energy*, vol 13, no 1, 1977, p 48-51 5 refs Translation

**A77-45610** # Utilization of wind energy for electrical power supplies to ESSOR stationary platforms (Utilisation de l'énergie éolienne pour l'alimentation électrique des plates-formes stationnaires ESSOR). J. Goas (Météorologie Nationale, Paris, France), *La Météorologie*, Mar 1977, p 85-88 In French

Model tests and full-scale tests of the performance of a horizontal-axis wind-powered generator are described. Technical data, weight optimization, and output optimization are discussed. Overall efficiency of 30-35 percent, corresponding to 37-44 percent energy conversion efficiency, is envisaged R D V

**A77-45628** Review of toroidal theta-pinch theory R. C. Davidson (California, University, Los Alamos, N. Mex.), Maryland, University, College Park, Md.) and J. P. Freidberg (California, University, Los Alamos, N. Mex.) In: Pulsed high beta plasmas, Proceedings of the Third Topical Conference, Abingdon, Oxon, England, September 9-12, 1975 Oxford, Pergamon Press, 1976, p 13-38 99 refs ERDA-sponsored research

The development of the Scyllac configuration into a pulsed high-beta thermonuclear reactor, based on the theta pinch concept, is considered. Disadvantages of linear theta pinch devices led to the toroidal concept. A description of alternate configurations is presented and the reasons are discussed for the ultimate rejection of these configurations. The Scyllac concept was selected as a result of the initial studies regarding a suitable toroidal concept. A report of the current status of Scyllac theory is presented, giving attention to several new results on toroidal equilibrium, MHD stability, and heating and anomalous transport G R

**A77-45712** Geography of energy production in France. V. The markets of consumption. The Paris region and the Lyon, Strasbourg and Rennes areas (Géographie de la production d'énergie en France V - Les marchés de consommation La région parisienne et les agglomérations lyonnaise, strasbourgeoise et rennaise) R. Orizon *Revue de l'Energie*, vol 28, June-July 1977, p 381-385. In French

**A77-45873** 'Co-disposal' for solid wastes and sewage sludge D. Sussman (U.S. Environmental Protection Agency, Washington, D.C.) *Waste Age*, vol 8, July 1977, p 44, 46, 49.

The possibility of integrating waste water treatment and solid-waste incineration to provide an energy-conserving disposal process is discussed. The 'co-disposal' technique uses energy produced from the combustion of solid wastes to dewater sludges found in wastewaters. Two designs for a 'co-disposal' system are considered, one involving sewage sludge incinerators that burn the organic portion of solid wastes to reduce the volume of solids, the second involving a solid-waste incinerator, solid waste-fired steam generator, or waterwall combustion unit to burn dewatered sludge. Operating treatment plants of both types are described, problems in their development, including those connected with dewatering, efficient combustion, and treatment of vapor byproducts are also mentioned J M B

**A77-45918** Aerospace and HVAC&R Spinoff '77 - Reaping the dividends N. P. Ruzic (National Space Institute, Washington, D.C.) *ASHRAE Journal*, vol 19, Aug 1977, p 30-35

Industrial applications of U.S. space technology are discussed. Topics include aerial reconnaissance thermograms to determine heat losses from buildings, capillary heat pipes used to insulate oil pipelines or recover heat from chimney flue losses, analyses of materials subject to high-temperature stress, analyses of creep fatigues, computerized design aids for fans, heat exchangers and piping systems, aluminized mylar insulation, solar cells and collectors, and fuel cells. NASA Industrial Applications Centers, where technical information is made available to the public, are listed, the availability of patents for licensing is also discussed J M B

**A77-45925** Fuel conservation through airplane maintenance *Exxon Air World*, vol 29, no 3, 1977, p 64-69

Maintenance (or restoration) of an aerodynamically clean aircraft surface and its payoff in minimizing drag, and concomitantly contributing to holding fuel cost increases down, are discussed. Out-of-flush rivet heads and seals, skin joints protruding into the airflow, leaks, door misalignment, rough skin patches, and dents can add to drag and result in fuel burn penalties. While contributions from any of these factors may be minimal, they can add up and



interact Fuel burn penalties are figured against maintenance/repair costs for many such items, and accounting experience shows sizable savings through maintenance of aerodynamic cleanness The 'top ten' drag-enhancing and fuel-penalty problems are listed, and some representative irregularities are illustrated R D V

**A77-45954** **Underground coal gasification.** G H Lamb Park Ridge, N J, Noyes Data Corp (Energy Technology Review, No 14), 1977 269 p 203 refs \$36

The theoretical aspects of coal gasification are examined, taking into account fossil fuel thermal efficiency, chemical reactions, convective instabilities, factors influencing coal plasticity, plasticity considerations, the reactivity of chars, the kinetics of coal pyrolysis, isothermal vs nonisothermal kinetic methods, liquids from coal pyrolysis, and solid products General methods of underground gasification are considered and a description is presented of operational techniques, designs, and studies, giving attention to shaft methods, the shaftless method, combination methods, aspects of site selection, site characterization, coal processing experiments, materials research, and explosive fracturing studies U S programs are discussed along with proposed alternative methods and improvements, technical problems and limitations, measurement and instrumentation systems for in situ processing, international developments, environmental implications, and economics G R

**A77-45956** **Power plants and future fuels, Proceedings of the Conference, London, England, January 21, 22, 1975** Conference sponsored by the Institution of Mechanical Engineers. London and New York, Mechanical Engineering Publications, Ltd, 1976 234 p \$38

The contributed papers lay emphasis on vehicular power plants The outlook for the stratified-charge engine, automotive gas turbine engine, Stirling engines, Wankel rotary engine, the Honda CVCC carbureted three-valve stratified-charge engine, fuel cell power plants, spark-ignition engines, diesel engines for small vehicles, sodium/sulfur battery (for railroad traction), and aviation engines are discussed Alcohol-gasoline mixtures, coal (for diesels), methanol/gasoline blends, fuel vaporization schemes, and use of heat pipes in fuel vaporization are dealt with R D V

**A77-46088** **Effect of two-dimensional inhomogeneities on the properties of framed MHD channels.** S A Medin and I M Rutkevich (Akademiia Nauk SSSR, Nauchno-Issledovatel'skii Institut Vysokikh Temperatur, Moscow, USSR) (*Teplofizika Vysokikh Temperatur*, vol 14, Nov-Dec 1976, p 1305-1312) *High Temperature*, vol. 14, no 6, May 1977, p 1166-1173 7 refs Translation

An analytical study is presented of two-dimensional electrodynamic effects in an ideally sectioned frame-like MHD generator channel The effect of inhomogeneities on the mean-integral power and the electrical efficiency of the generator is examined A potential-distribution model shows that at large values of the Hall effect, power in a frame-like channel of rectangular cross section is greater than in an analogous Faraday channel B J

**A77-46091** **Increasing the electrical strength of the inter-electrode gap in an MHD generator.** I I Mazur, O Ia. Kazakevich, A. A Miroshnichenko, and B I Terekhovskii (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR) (*Teplofizika Vysokikh Temperatur*, vol 14, Nov-Dec 1976, p 1329-1331) *High Temperature*, vol 14, no 6, May 1977, p 1193-1195 Translation

Blowing the electrodes with a gas mixture can lead to an inadmissible impurity content of more than 1% and to impairment of stoichiometry in the main flow of MHD-generators The aim of the experiments described in the present paper was to study the effects of blowing standard metal electrodes with an air-gas mixture and with natural gas, with a view toward developing methods of improving electrode efficiency Since such methods of protecting electrode surfaces can impair the electric insulation provided by the gas, the electric strength of gas-insulated electrodes and of electrodes employing a fireproof insulating ceramic in the gap was investigated It was found that blowing with gas mixtures is a much more effective

means of improving the electric strength than the use of monolithic ceramic insulation and that blowing with natural gas is distinctly inferior to blowing with air-gas mixtures V P

**A77-46093** **Energy supply to the year 2000 Global and national studies** Edited by W F Martin Cambridge, Mass, MIT Press, 1977 418 p \$29 95

The book reports the results of energy supply studies, conducted as an international project and involving over seventy-five people from fifteen countries Methods were developed for estimating energy supply and demand through the year 2000 and for integrating them A description is provided of the methodology and major conclusions of the supply studies Individual global overviews are included for oil, natural gas, coal, nuclear energy, other fossil fuels, and renewables such as hydroelectricity and geothermal and solar energy Individual national supply studies are discussed, giving attention to Canada, Denmark, Finland, France, the German Federal Republic, Italy, Japan, Mexico, the Netherlands, Norway, Sweden, the United Kingdom, and the U S G R

**A77-46094** **Energy demand studies. Major consuming countries. Analyses of 1972 demand and projections of 1985 demand** Edited by P S Basile Cambridge, Mass, MIT Press, 1976 564 p \$20

The nations considered in the studies consumed in 1972 approximately 80 percent of the total energy consumed in the world outside the COMECON countries and China A methodology section describes the adaptation of the general approach to individual national circumstances and the specific procedures used in projection energy demand An analysis section includes a discussion of the economic activity level and energy efficiency assumptions used in estimating energy use in major market sectors Another section contains summary tables and detailed worksheets presenting economic, efficiency, and energy-use data The countries considered include Canada, Denmark, Finland, France, Germany, Iran, Italy, Japan, Mexico, the Netherlands, Norway, Sweden, the United Kingdom, the U S, and Venezuela G R

**A77-46250** **Biomass energy for Hawaii Volume 1 - Summary and background Volume 2 - Sugar operations Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations** Edited by A Gill, C Beck, K Salvesen, L Chun, C. Yang, D Murata, and M Keller Stanford, Calif, Stanford University, 1977 Vol 1, 175 p, vol 2, 159 p, vol 3, 212 p, vol 4, 243 p Price of four volumes, \$20

The conversion of biomass resources into energy, fuels and by-products is discussed, with attention given to programs in Hawaii involving terrestrial and marine biomass plantations, energy recovery from municipal refuse treatment plants and uses for sugar cane harvesting wastes Biomass conversion processes to increase the available energy supply in Hawaii, such as direct combustion, pyrolysis anaerobic digestion or fermentation, are described In particular, the generation of electrical power from bagasse (sugar cane waste) and the production of ethanol fuel as a by-product of sugar refining are considered Schemes for exploiting municipal refuse resources, including use of pyrolytic gases in power plants, are also treated The reports emphasize an interdisciplinary approach to the energy problem, relying on legal and economic analyses as well as technical studies J M B

**A77-46401** **Gas turbines - Status and prospects; Proceedings of the Symposium, London, England, February 4, 5, 1976.** Symposium sponsored by the Institution of Mechanical Engineers. London and New York, Mechanical Engineering Publications, Ltd (I Mech E Conference Publications, No 1976-1), 1976. 164 p \$27.

Aspects of gas turbine evolution are considered along with the status and the prospects of the aircraft gas turbine, the design of gas turbines for the industrial and the marine field, the airline viewpoint, gas turbines in the RAF from a maintenance engineering viewpoint, the Royal Navy's experience with main propulsion gas turbines, the

status and prospects of the industrial gas turbine, and the designer's dilemma with unmanned controls and the gas turbine user. Attention is also given to a new maintenance concept applied in the design of a new industrial gas turbine in the 100 MW class, experience with gas turbines in the field by a British petroleum company, gas turbines in a powered distribution system, monitoring for preventive maintenance in the small fleet, gas turbine power for large hovercraft, and the gas turbine in the gas transmission environment G R

**A77-46402** Gas turbine evolution F W Armstrong (National Gas Turbine Establishment, Farnborough, Hants., England) In Gas turbines - Status and prospects, Proceedings of the Symposium, London, England, February 4, 5, 1976 London and New York, Mechanical Engineering Publications, Ltd, 1976, p 1-15 17 refs

The paper discusses the continuing evolution of the gas turbine, and makes a broad assessment of future prospects. The scope for further development of the various facets of gas turbine technology is considered first. The second part of the paper suggests how gas turbine powerplants for aeronautical, marine and land-based applications might evolve as a result of technical, economic and environmental influences (Author)

**A77-46404** Designing gas turbines for the industrial and marine field N L Shorthose (Rolls-Royce /1971/, Ltd, Industrial and Marine Div, Ansty, Warwick, England) In Gas turbines - Status and prospects, Proceedings of the Symposium, London, England, February 4, 5, 1976 London and New York, Mechanical Engineering Publications, Ltd, 1976, p 27-34

Some of the design changes involved in preparing aero engines for industrial and marine use are examined. The aero engine in its new environment is considered, taking into account approaches for protecting compressor component materials against corrosion, the occurrence of dangerous resonance effects in connection with differences concerning the operating regime, turbine-related problems, combustion difficulties, and design changes with respect to accessories and accessory gearboxes. It is found that in the case of certain gas turbines the basic aero form can also be used for an employment as gas producer in industrial applications. For other engines basic configuration changes are required G R

**A77-46408** The industrial gas turbine - Its status and prospects J R Tyler (Ruston Gas Turbines, Ltd, Lincoln, Lincs, England). In Gas turbines - Status and prospects, Proceedings of the Symposium, London, England, February 4, 5, 1976. London and New York, Mechanical Engineering Publications, Ltd, 1976, p 65-74

The paper reviews briefly the history of the gas turbine and the post war emergence of the industrial machine following a separate path from that of the aircraft engine. Because of its characteristics, application has been restricted to three general fields, standby or peaking duty, total energy and the oil and gas industry, of which the last named was the first major user. The environmental factors peculiar to the oil industry combined with the extreme importance of reliability has greatly influenced the design of machinery and systems. This is illustrated by a description of a typical industrial gas turbine and by some examples from operating experience in a wide variety of applications. The accelerated search for gas and oil particularly offshore, is likely to sustain the demand for gas turbines while pressure to conserve existing resources may lead to a greater interest in local power generation using the 'total energy' principle. (Author)

**A77-46410** A new maintenance concept applied in the design of a new industrial gas turbine in the 100 MW class T E Thoren (Stal-Laval Turbin AB, Finspong, Sweden) In Gas turbines - Status and prospects, Proceedings of the Symposium, London, England, February 4, 5, 1976 London and New York, Mechanical Engineering Publications, Ltd., 1976, p 81-90

Second generation industrial gas turbines will have advanced performance data to fit future high fuel costs. Equally important is that availability is high. A durable well analyzed design with provisions for quick repairs should yield the best availability. The

paper describes a new concept in maintainability applied in the design of a new industrial gas turbine in the 100 MW class, developed in cooperation between Stal-Laval and United Technologies. A three-shaft machinery lay-out lends itself to a large degree of modularization. Possibility for quick changeout of modules is a good guarantee for high availability (Author)

**A77-46413** Some observations on the selection of gas turbine generating plant L J Spinks (Preece, Cardew and Rider, Consulting Engineers, Brighton, England) In Gas turbines - Status and prospects, Proceedings of the Symposium, London, England, February 4, 5, 1976 London and New York, Mechanical Engineering Publications, Ltd, 1976, p 147-156.

Observations are made concerning miscellaneous problems associated with the application of gas turbine plant for power generation in medium to large unit sizes. Attention is directed to problems relating to the continued rapid development to higher ratings and to operation and maintenance in developing countries and hostile environments. The paper concludes with a note on future trends (Author)

**A77-46426 #** Circumferential variations of bore heat flux and outside surface temperature for a solar collector tube E M Sparrow and R J Krowech (Minnesota, University, Minneapolis, Minn) *ASME, Transactions, Series C - Journal of Heat Transfer*, vol. 99, Aug 1977, p 360-366 7 refs

**A77-46449** Liquid fuels and chemical feedstocks from coal by supercritical gas extraction N Gangoli and G Thodos (Northwestern University, Evanston, Ill) *I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol 16, Sept. 1977, p 208-216 50 refs

As an alternative source of energy, theoretical arguments and basic experimental evidence of a new separation technique for the extraction of liquid fuel constituents from coal are presented. The technique is based on the solvent capability of compressed gases under supercritical state conditions. Several research investigations regarding the chemical constitution of coal are described and a study of the critical state behavior of various simple and complex mixtures is presented in detail, including the possibility of a liquid phase occurrence. The five basic steps of the new process are outlined. Detailed lists of the advantages of this new technique, and particularly its advantages over the older method of liquid extraction are included. Other applications of the method are briefly surveyed SCS

**A77-46467 #** Morphological analysis as a design aid: An application to solar energy conversion processes (Contribution à l'aide à la conception par l'analyse morphologique. Application à des filières de conversion de l'énergie solaire) P Labat Toulouse III, Université, Docteur (3e cycle) Thesis, 1977. 215 p 43 refs In French

The optical and thermal properties of solar radiation relevant to the design of solar energy flat-plate collectors, as well as the luminance and emissivity characteristics of absorptive agents, are reviewed. Disadvantages of systems using flat-plate collectors without heliostats, including their unsuitability for coupling with efficient thermodynamic cycles, and the energy losses encountered during increases in the temperature of heat-carrying fluids circulating in the systems, are discussed. Properties and possible configurations of systems employing solar concentrators, such as cylindrical parabolic mirrors, are also given. A computer program based on morphological analysis is then developed which takes into account these design parameters to formulate a least costly flat-plate collector system. The sample problem tested has the advantages of involving very brief computing times JMB

**A77-46469 #** An electrooptical model for the design of semiconductor solar cells (Modèle optoélectronique pour la conception de piles solaires à semiconducteur). J-C. Suau Toulouse III, Université, Docteur (3e cycle) Thesis, 1977 180 p. 42 refs. In French

Photovoltaic cells for use in solar energy systems are studied, with the emphasis on increasing cell efficiency in energy conversion. The electrical properties of pn junctions and Schottky barrier diodes are reviewed, and a numerical technique for simulating the performance of solar energy systems using these components is formulated. The quality, stability and cost of thin silicon layers for solar cell applications are discussed, experiments involving silicon deposition onto substrates of various resistivity are conducted, with the aim of studying photocurrent as a function of doping. The absorption and deposition characteristics of other films, such as CdTe layers, are also assessed. It is suggested that a combination of optical concentrators and photovoltaic cells may yield viable energy conversion systems J.M.B

**A77-46550** A large solar heating system for a Saudi campus complex J R Schneider and S F Glover (Sverdrup and Parcel and Associates, Inc., St Louis, Mo.) *Building Systems Design*, vol 74, Aug.-Sept, 1977, p 28-43. 5 refs.

The design program for the world's largest central heating system, designed to provide domestic hot water and building space heating in a campus complex of fourteen buildings, is described. The design heat loads are 36,000 gallons per day of domestic hot water, and a winter time building space heat load which is about the same size as the domestic hot water load on an annual basis. For hot water, 70 F well water is heated to 140 F delivery temperature, for building space heating water, the delivery temperature requirement is 120 F with a return temperature between 90 and 100 F. Data on the standard collector performance are provided, and the heating, storage, and distribution systems are characterized. A unique feature of the system is the stratified storage in a series of three series-connected 45-foot tall upright tanks. Seventy percent of the total heat load is supplied by solar energy - 100% of the hot water load and 40% of the heat load M.L.

**A77-46573** Hydrogen and oxygen from water E A Fletcher (Minnesota, University, Minneapolis, Minn.) and R L Moen *Science*, vol 197, Sept 9, 1977, p 1050-1056. 25 refs.

A preliminary proposal for an idealized model of a one-step, high temperature thermochemical effusional process for producing hydrogen and oxygen from water using solar energy is described. A schematic diagram of the apparatus and its system efficiency are defined along with a simple situation to show the effect of high temperature operation on the system efficiency. Membrane materials, and the design and production are discussed. A series of user-interactive computer experiments is developed to determine the optimum operation variables. It is concluded that the effusional separation of hydrogen and oxygen from water at high temperatures using solar power is possible S.C.S.

**A77-46608** Domestic hot water and solar energy in Ireland. F. Hand, B. Asare, and J. Haslett (Trinity College, Dublin, Ireland). *International Journal of Energy Research*, vol 1, July-Sept, 1977, p 249-257. 11 refs. Research supported by the EEC Energy Research and Development Programme.

The ability of two solar energy systems to supply domestic hot-water requirements in Ireland is studied by means of a computer simulation model of a system which uses a commercially available solar panel. The water-heating systems and the analysis of system performance are described. The model indicates that, for the cost of the systems to be economically justifiable in comparison with the costs of electricity, the water supply must be directly heated by solar panels and the installed cost of the panels must be low. It is thought that the system performance is relatively insensitive to panel orientation so that retrofit installations on existing houses could be feasible. M.L.

**A77-46609** Hydrogen and electricity from water and light. K. Ohashi, J. McCann, and J. O. Bockris (South Australia, Flinders University, Adelaide, Australia). *International Journal of Energy Research*, vol 1, July-Sept. 1977, p. 259-277. 12 refs.

Four self-driven photoelectrochemical hydrogen producers, n-TiO<sub>2</sub>/p-CdTe, n-TiO<sub>2</sub>/p-GaP, n-SrTiO<sub>3</sub>/p-CdTe, and n-SrTiO<sub>3</sub>/p-GaP, were constructed and examined in 1 M NaOH. The current-potential curves of the individual electrodes and the current-cell voltage relationships were measured. Cell current-density measurements versus time demonstrated that the output of each cell is stable for at least 12h. The n-SrTiO<sub>3</sub>/p-GaP cell under xenon light irradiation was the most efficient at 0.7 per cent. The n-TiO<sub>2</sub>/p-GaP cell was estimated as the most efficient under solar light at 0.1 per cent. The stability of p-CdTe and its energy gap of 1.5eV make it a prospect for use as a photocathode in future photoelectrochemical hydrogen producers (Author)

**A77-46627** New themes for space. Mankind's future needs and aspirations, *Proceedings of the Bicentennial Space Symposium*, Washington, D.C., October 6-8, 1976. Symposium sponsored by the American Astronautical Society and American Institute of Aeronautics and Astronautics. Edited by W. C. Schneider (NASA, Washington, D.C.). San Diego, Calif., American Astronautical Society (Advances in the Astronautical Sciences, Volume 35), 1977. 229 p. \$25.

Satellite communications, space manufacturing, remote sensing, and environmental observation are discussed. In the field of satellite communications, the special requirements of a military satellite communication system are explained, the use of satellites for mobile communications service is considered, and public service programs using NASA's ATS-6 and CTS satellites are discussed. Space stations and space manufacturing are examined with attention to equipment design, prospective products, and economic feasibility. Other topics include satellite power stations and the monitoring of crops and forests from space. M.L.

**A77-46633** The space station and space industrialization. R. L. Kline (Grumman Aerospace Corp., Bethpage, N.Y.). In *New themes for space. Mankind's future needs and aspirations, Proceedings of the Bicentennial Space Symposium*, Washington, D.C., October 6-8, 1976. San Diego, Calif., American Astronautical Society, 1977, p. 121-138. 6 refs. (AAS 76-050)

Space station concepts and modules are described, and the goals of the space station program are explained. A sequence of space stations is considered which begins with solar power stations and proceeds to public service stations and then space manufacturing stations. Four concepts for solar power stations are presented, and services that could be provided by a public service station are summarized. A space manufacturing station concept that could be used for the production of high coercive strength magnetic material is examined. Present and future development of the space station program is discussed. M.L.

**A77-46639** Prospects for satellite power stations. R. A. Summers (ERDA, Washington, D.C.). In *New themes for space. Mankind's future needs and aspirations, Proceedings of the Bicentennial Space Symposium*, Washington, D.C., October 6-8, 1976. San Diego, Calif., American Astronautical Society, 1977, p. 209-229. (AAS 76-058)

The solar satellite power station concept is discussed, and current and projected energy use patterns are considered. Advantages and disadvantages of a satellite power project are examined with attention to the technology status and targets, the environmental impacts, the economics and planning implications, and the likely institutional/international problems. Some research goals for the immediate future are suggested. M.L.

**A77-46652** A study of the effects of new transportation systems on urban transportation and environment by computer simulation. H. Tsuchiya, M. Abe (Jizai Engineering, Ltd., Tokyo, Japan), F. Harashima (Tokyo, University, Tokyo, Japan), A. Uehara, M. Ishikawa (Ministry of International Trade and Industry, Tokyo, Japan), and T. Itoh (Japan Automobile Research Institute, Inc., Ibaraki, Japan). In *Control in transportation systems, Proceedings of the Third International Symposium*, Columbus, Ohio, August 9-13,

1976 Helsinki, International Federation of Automatic Control, Pittsburgh, Pa., Instrument Society of America, 1976, p 245-251 5 refs Research supported by the Japan Society for Promotion of Machine Industry and Japan Society of Automotive Engineers

A computer simulation is employed to study the long-range effects of introducing into a city having a population of about one-half million any one or a combination of three transportation systems, including Personal Rapid Transit (PRT), Electric Vehicle and Electronic Route Guidance systems. The city is assumed to have rapid transit and a bus system at the outset. The simulation takes into account the distribution of stations, and uses a mathematical model to determine the modes of travel selected by the projected passengers. Quality of the modified transportation systems is assessed by indices such as average trip time, crowding rate at rush hours, energy consumption and air pollution levels. Results of the simulation indicate that introduction of PRT lessens demands on automobile, bus and rapid transit modes and yields eventual reductions in average trip time and energy consumption J M B

**A77-46722** Porous electrodes for Zn/air alkaline battery I Amato, S Corso, and E Sgambetterra (Fiat S.p.A., Turin, Italy) In Modern developments in powder metallurgy Volume 11 Proceedings of the Fifth International Powder Metallurgy Conference, Chicago, Ill, June 27-July 2, 1976 Princeton, N.J., Metal Powder Industries Federation, American Powder Metallurgy Institute, 1977, p 331-339 6 refs

An investigation has been conducted concerning the development of suitable techniques for the fabrication of dual porosity electrodes for fuel cell applications involving the use of nickel catalysts in an alkaline environment. The double layer electrode employed contains micropores, which are in contact with the electrolyte, and macropores, which are in contact with the gas. A powder metallurgy process for the manufacture of the electrodes has been studied. Attention is given to die pressing and sintering, roll compaction of carbonyl nickel powder, experiments concerning the spray deposition of a slurry suspension, and the reinforcement of the electrodes with the aid of an incorporated wire mesh G R

**A77-46768** Computing residuals in geothermal research by I.R. scanning. A. M. Tonelli (ARCO, Milan, Italy) *British Interplanetary Society, Journal (Remote Sensing)*, vol 30, May 1977, p. 187-192

The thermal phenomena related to the presence of geothermal sources is examined stressing the increase in the local smoothing of temperature variations in time and space due to an increase of thermal inertia, a minimum in the distribution of the normalized gradients, the minimum variation of entropy, and the minimum shift of the thermal baricenters. The smoothing technique involves applications of infra-red scanning to both rectified and non-rectified images. The effect of geothermal heat on thermal inertia is discussed, and a method for its analysis is suggested S C S

**A77-46770** On the realization of projects - With special reference to O'Neill space colonies and the like A V Cleaver *British Interplanetary Society, Journal (Space Colonization)*, vol 30, Aug 1977, p 283-288

A general critique of the O'Neill proposals (1974) for giant space colonies is considered from the standpoints of the feasibility and the probability of the project. It is suggested that such colonies are theoretically feasible as they do not violate any fundamental laws, and require only the refinement of existing technology. The realization of such a proposal is reviewed both in terms of the motivation and costs, evaluating specifically political reasons, personal motivation, practical considerations, inflation, specification, program changes, and the inhibition of an honest estimation. It is concluded that although at present such a project is too expensive, continued study of its long term possibilities is advised as the practical need for the development of solar power stations and/or orbiting space factories may arise S C S

**A77-46771** A preliminary cost benefit analysis of space colonization. M M Hopkins (Harvard University, Cambridge, Mass.) *British Interplanetary Society, Journal (Space Colonization)*, vol 30, Aug 1977, p 289-300 16 refs

The economic results of the NASA-Ames-Stanford ASEE 1975 Summer Study of Space Colonization are presented. The system of space colonization is considered in general terms as to its set-up, economic viability, the steps in its construction, and the consumer benefits posited. The proposed production schedule for the space colonies and the space shuttle is reviewed. An estimation of the cash flow based on a yearly review is discussed along with suggestions for alternate pricing schemes, such as the possibility of appealing to a foreign market, other ways of obtaining electrical power, and the possibilities for space industrialization. Benefits relating to environmental concerns, satellite functioning, and space manufacturing are discussed. The article is concluded with four detailed appendices which treat the production schedule and related costs, price considerations, variables dependent on subsequent colonies, and the environmental impact of microwave power transmission S C S

**A77-46775** Powersats - An economic assessment H O Ruppe (Munchen, Technische Universität, Munich, West Germany) *British Interplanetary Society, Journal (Space Colonization)*, vol 30, Aug 1977, p 317-320 6 refs

The economic feasibility of Powersats (satellite solar power stations) is discussed. Problems such as a conversion system of solar to electric power at the scale needed, microwave power transmission, and high voltage space traffic show that technological feasibility has not yet been demonstrated. However, the advantages, such as the availability of primary energy, and the freedom from chemical and nuclear pollutants call for an economic analysis. A development schedule consisting of three phases is outlined: 1) bringing the carrier system into initial operating capability, 2) developing the first Powersat, 3) beginning its operation. Details of the costing are reviewed and it is concluded that both technical feasibility and economic vitality are doubtful, and that the long realization period and the requirement for tremendous capital outlay make the project impractical S C S

**A77-46783 #** Rechargeable batteries in Japan. Edited by Y Miyake (Government Industrial Research Institute, Osaka, Japan) and A Kozawa (Union Carbide Parma Technical Center, Cleveland, Ohio) Cleveland, JEC Press, Inc., 1977 521 p. \$43

The history and the present status of technology of the Japanese lead-acid battery industry is examined and various developments related to lead-acid batteries are considered, taking into account high performance automobile lead acid batteries, dry charged lead-acid batteries for automobile applications, glass fiber tubular type industrial batteries, sealed lead acid stationary batteries with catalyst plug, auxiliary electrode gas recombination sealed stationary lead-acid batteries, and small sealed lead acid batteries with gelled electrolyte. Attention is also given to nickel-cadmium batteries, silver zinc rechargeable batteries, catalyst plug devices for storage batteries, and lead acid batteries for a use in electric vehicles G R

**A77-46786** The consumer's electric car. E H Wakefield Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1977 145 p 26 refs \$9.95

Problems in the design and maintenance of electric vehicles for use in personal transportation are discussed. A study of driving habits in the U.S., which indicates that 50% of gasoline-powered cars travel less than 28 miles per day, and that 54% of the trips are under 5 miles, is used to illustrate the viability of low- and medium-range high-efficiency electric cars. Government regulation, power requirements, energy consumption and the economics of electric vehicles are also considered. Electrical specifications and means of measuring the efficiencies of electric cars are given, in particular, series-wound dc motors, shunt wound motors, and cumulative compound-wound dc motors are described. Maintenance of the motors and suggestions for improving road performance of electric vehicles are listed for reference. Novel electric vehicle power sources, such as those involving solar energy, are also mentioned J M B

**A77-46787** Space and energy, Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975. Congress sponsored by the International Astronautical Federation Edited by L. G. Napolitano (Napoli, Università, Naples, Italy) Oxford and New York, Pergamon Press, 1977 495 p \$50

The papers deal with recent developments in space technology, astronautics, astrodynamics, and bioastronautics. The main subject areas are the utilization of solar energy and of energy generated in space, engineering and life sciences, space systems and technology, and applications satellites. Specific topics include solar energy systems, the Spacelab electric power system, gaseous-core reactors and nuclear-pumped lasers for space power generation and transmission, the construction of satellite solar power stations in space, qualitative techniques in celestial mechanics, the possible use of interplanetary orbits as a gravitational-wave detector, the attitude stabilization system and solar array of the Communications Technology Satellite, the contribution of biological satellites to space medicine, and atmosphere revitalization aboard Spacelab. Other contributions discuss propulsion system concepts for single-stage space shuttles, reliability design criteria for the Mariner Jupiter/Saturn spacecraft, the development of an experimental hybrid rocket, the Large Space Telescope, a mission design for a 1980 Pioneer Jupiter orbiter, progress and trends in commercial satellite communications, the Marisat system, side-looking radar systems for Spacelab, and basic concepts of a complete multiband photographic system for remote-sensing applications. F G M

**A77-46788** Earth, an open system - The use of solar energy. A. L. Jaumotte (Bruxelles, Université Libre, Brussels, Belgium) In Space and energy, Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975. Oxford and New York, Pergamon Press, 1977, p 3-27 45 refs

The article provides a survey of the possible utilizations of solar energy, both in terms of immediate targets and long range goals. Two applications of low-temperature thermal energy are described: the heating and cooling of solar dwellings, and the solar irrigation pump. Possible improvements for agricultural science applying solar energy to photosynthesis are suggested. Recommendations for combining solar energy with optical concentrations are presented, such as the development of heliostats, and long range prospects for Satellite Solar Power Stations (SSPS). The article concludes with a few notes on pollution caused by solar energy, and the contribution of such research to space technology. S C S

**A77-46789** The electrical power system for Spacelab. B. Gohrbandt and E. F. Schmidt (Telefunken AG, Hamburg, West Germany) In Space and energy, Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975. Oxford and New York, Pergamon Press, 1977, p 29-43

Following an overview of the Spacelab's mission requirements, such as its general weight, power consumption, and heat dissipation, the Electrical Power and Distribution Subsystem (EPDS) is described in full with subsystem design requirements and primary design criteria listed. A block diagram of the EPDS is shown and separate presentations are made for the following features: (1) the power conditioning and distribution concepts, (2) power sources, (3) power conditioning equipment, (4) power distribution, monitoring and protection, (5) the emergency power system, (6) the lighting system, and (7) signal conditioning. It is concluded that the EPDS provides the flexibility necessary for various payloads and configurations of the Spacelab mission. S C S

**A77-46878** # A space station for the 1980's - A look at the next generation of operational systems and their functional requirements. R. J. Gunkel and H. L. Wolbers (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). ASME, SAE, AIAA, ASMA, and AICHE, Intersociety Conference on Environmental Systems, 7th, San Francisco, Calif., July 11-14, 1977, ASME Paper 77-ENAS-37 9 p 5 refs. Members, \$1 50, nonmembers, \$3 00.

Potential applications and requirements proposed to increase the efficiency and effectiveness of future continuously manned space stations are described. Three examples are discussed: space processing, earth services, and satellite power systems. The implementation procedures for the development of such space systems are outlined along with a proposed construction schedule and the critical factors to be considered in future planning activities are reviewed. The key technology needs for future environmental systems are described including technology for space processing, extravehicular activity, fabrication and assembly techniques, interaction with the space environment, electrical power systems, and long-duration environmental control and life support systems. S C S

**A77-46885** \* # Space construction base support requirements for environmental control and life support systems. R. J. Thiele, T. C. Secord, and G. L. Murphy (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). ASME, SAE, AIAA, ASMA, and AICHE, Intersociety Conference on Environmental Systems, 7th, San Francisco, Calif., July 11-14, 1977, ASME Paper 77-ENAS-44 10 p 11 refs. Members, \$1 50, nonmembers, \$3 00. Contract No. NAS9-14958.

A Space Station analysis study is being performed for NASA which identifies cost-effective Space Station options that can provide a space facility capable of performing space construction, space manufacturing, cosmological research, earth services, and other functions. A space construction base concept for the construction of large structures, such as those needed to implement satellite solar power for earth usage, will be used as a basis for discussing requirements that impact the design selection, level of integration, and operation of environmental control and life support systems (ECLSS). The space construction base configuration also provides a basic Space Station facility that can accommodate biological manufacturing modules, ultrapure glasses manufacturing modules, and modules for other services in a building-block fashion. Examples of special problems that could dictate hardware required to augment the basic ECLSS for autonomous modules will be highlighted. Additionally, overall intravehicular (IVA) and extravehicular (EVA) activities and requirements that could impact the basic station ECLSS degree of closure are discussed. (Author)

**A77-46890** # Waste resources - Problems and promise. D. K. Walter (ERDA, Urban Waste Technology Branch, Washington, D C). ASME, SAE, AIAA, ASMA, and AICHE, Intersociety Conference on Environmental Systems, 7th, San Francisco, Calif., July 11-14, 1977, ASME Paper 77-ENAS-49 8 p. Members, \$1 50, nonmembers, \$3 00.

Communication problems concerning the meaning of the term 'efficiency' are examined and efficiency calculations conducted according to seven different computational concepts are considered. Attention is given to the costs of a typical landfill operation, an energy and material system, the energy from waste technology, options concerning waste utilization, waste sources, and the ERDA research and development program for energy-from-wastes systems. Major factors in favor of commercializing urban waste to energy processes are discussed. G. R.

**A77-46909** # Design of a low cost space heating system using warm geothermal or industrial effluents. A. J. Pate and J. C. Batty (Utah State University, Logan, Utah). American Society of Mechanical Engineers, Design Engineering Conference and Show, Chicago, Ill., May 9-12, 1977, Paper 77-DE-26. 8 p 37 refs. Members, \$1 50, nonmembers, \$3 00.

The design of an effective heating system employing moderate temperature (100 to 150 F) geothermal waters to heat greenhouses without any backup conventional system is discussed. The use of nonspecialized materials is emphasized with the result that maintenance is simple, fast, and requires no skilled labor. The heat exchanger system development starts with conventional methods and evolves, through heat transfer analysis and a series of simplifications, to a versatile system which tends to maintain a more stable temperature in the greenhouse than conventional greenhouse heating systems. Problems encountered in using geothermal brines are

reported, and inexpensive solutions to these problems are suggested. The complete design is also outlined, with consideration given to heat transfer calculations as well as economic factors. A model of the system was constructed and tested for use as a retrieval system for energy in industrial thermal effluents as well as in geothermal waters. (Author)

**A77-46959 #** Quasi-analog models of large systems of algebraic equations (Kvazianalogovye modeli bol'shikh sistem algebraicheskikh uravnenii) M N Kulik, V D Bakumenko, A Aminov, and V N Chumakov (Akademiia Nauk Ukrainsoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR) *Matematicheskoe Modelirovanie i Teoriia Elektricheskikh Tsepei*, no 15, 1977, p. 34-41 5 refs In Russian

The paper presents a matrix two-component dc modeling circuit for solving systems of linear algebraic equations which is highly stable for an arbitrary nonsingular matrix of the coefficients of the system to be solved. Results of tests of the dynamic characteristics of the circuit show that it is fit for use as an electric network model in computers for calculating energy system operations. P T H

**A77-47080** Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea. M A Kropotkin and T Iu Sheveleva (Leningradskii Elektrotehnicheskii Institut, Leningrad, USSR) (*Kvantovaya Elektronika* /Moscow/, vol 4, Apr 1977, p 911-913) *Soviet Journal of Quantum Electronics*, vol 7, Apr 1977, p 513-515 6 refs Translation.

**A77-47173** The ecology of a marine littoral receiving effluents from a petroleum refinery (Quelques données sur l'écologie d'une zone marine littorale recevant les rejets d'une raffinerie de pétrole) J Le Petit, M-H N'Guyen, and S Tagger (Aix-Marseille III, Université, Marseille, France) *Environmental Pollution*, vol 13, May 1977, p 41-56 22 refs In French

**A77-47174** Power with heliostats A F Hildebrandt and L L Vant-Hull (Houston, University, Houston, Tex) *Science*, vol 197, Sept 1977, p 1139-1146 18 refs Research supported by the University of Houston, NSF Grants No GI-39456, No AER-73-07950-A03, Grant No EG-76-05-5178, Contract No E(04-3)-1108

A proposal for the use of heliostats as a means to produce solar energy in quantities great enough to power the electric and gas utilities, i.e., with high-quality heat of at least 300 C and where individual units produce approximately 100 MW of electricity, is outlined. The plan of the solar thermal power system is discussed in detail including variations in its construction for specific needs. Specifically, the design of the heliostat field, the receiver, tower, and storage facilities are considered. The environmental concerns of such plants are reviewed, as are questions regarding cost planning and reduction. It is concluded that although the cost of producing solar power plants is similar to that of other means of energy production, solar energy production will become increasingly more important in terms of long range economic and political plans. S C S

**A77-47201 #** Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories (SVCh-radiometricheskoe issledovanie zemnykh pokrovov i akvatorii s borta samoletov-laboratorii) L F Borodin, A A Kurskaia, and A M Shutko In Space studies of earth resources. Methods and means of measurement and data processing. Moscow, Izdatel'stvo Nauka, 1976, p 290-296 In Russian

The following geophysical uses of aerial microwave radiometry are considered: determination of sea states and temperatures, studies of soil moisture, detection of regions of geothermal activity, forest fire mapping, sea and land ice reporting, and determination of soil density gradients. Attention is given to specific recordings of radio thermal emission signals and radio brightness data in the spectral range 0.8-30 cm. B.J

**A77-47210** Energy from solid waste utilization; Proceedings of the Sixth Annual Northeastern Regional Antipollution

Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, University of Rhode Island, Kingston, R.I., July 8, 9, 1975. Edited by S M Barnett, D Sussman, and C J Wilson. Westport, Conn, Technomic Publishing Co, Inc, 1976 422 p. \$35

Papers are presented on the shredding of municipal solid wastes and the potential markets for recovered products, including the recycling of ferrous metals, the economics of separate refuse collection, and industrial development based on resources recovery. A solid waste management planning model is discussed along with risk management and an approach to material equilibrium. Several processes for energy and resources recovery are outlined, such as fuel derivatives from municipal solid wastes, the Ames, Iowa, project for power generation; fluidized-bed incineration of waste materials, and the Selectomatic Commest solid waste system. Alternative processes for solid waste utilization are suggested, including methane production, a refuse-derived fuel, incineration, recycling, and steam recovery. S C S

**A77-47211** Economics of solid waste conversion. H A Gorges (Tractor Jitco, Inc, Rockville, Md) In Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R I, July 8, 9, 1975. Westport, Conn, Technomic Publishing Co, Inc, 1976, p 81-94

A method is developed to evaluate the economic viability of a solid waste recovery and conversion system. Variables are considered such as predicting industrial and demographic conditions, calculating environmental impact, and institutional constraints. The parameters used to determine the plant's performance are identified, and a procedure is suggested for regulating the cash flow cycle through the system, including (1) cost assessment, (2) a break-even method to establish a measure for the sales value of the energy produced (the ratio of the price of the heat value sold to the equivalent cost of crude oil in dollars/barrels), (3) evaluation of the price structure in a competitive market, (4) establishing economic guidelines, and (5) determining the constraints and bounds of the system. S C S

**A77-47213** Potential alternative fuel derivatives from municipal solid wastes. J F Schnelle, Jr (Combustion Engineering, Inc, Providence, R I) and J H Yamamoto In Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R I, July 8, 9, 1975. Westport, Conn, Technomic Publishing Co., Inc., 1976, p 167-208.

Various methods of using shredded solid waste as a supplementary fuel source are discussed, specifically (1) heat recovery based on a waterwall incinerator, (2) solid refuse fuel recovery by either dry-shedding or wet-pulping techniques, and (3) chemical and biochemical conversion by several pyrolysis processes for the production of gas and oil. The methods are compared with respect to capital and operating costs as well as output streams. It is concluded that fuel recovery is the most economically promising resource recovery process, with material recovery, pyrolysis, and composting being more expensive alternatives. The advantages and disadvantages of energy recovery are summarized. S C S

**A77-47214** A supplementary fuel for power generation /Ames, Iowa/ H Funk (Henningson, Durham and Richardson, Omaha, Neb) and R Sheahan (Henningson, Durham and Richardson, Washington, D C) In Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R.I., July 8, 9, 1975. Westport, Conn, Technomic Publishing Co, Inc., 1976, p 209-220

A summary is presented of the technical and economic aspects of a solid waste recovery system in Ames, Iowa, which studied the

feasibility of burning the combustible part of the solid waste as supplemental fuel. The quantities and characteristics of the solid waste are discussed along with the major mechanical components of the processing facility (receiving area, primary shredding, air density classifier, combustibles separation, etc.), and the estimated costs and revenues (capital costs, operating costs, etc.). It was concluded that the basic principle of supplementary refuse fuel firing could be applied successfully to the Ames power plant SCS

**A77-47215** Energy and resource recovery from solid wastes. G. M. Mallan and E. I. Titlow (Garrett Research and Development Co., Inc., La Verne, Calif.). In: Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R.I., July 8, 9, 1975. Westport, Conn., Technomic Publishing Co., Inc., 1976, p. 221-250.

A method is described for the conversion of the organic portion of municipal solid waste into useable fuel and for the recovery of valuable metals and glass. The steps of the process include (1) primary shredding, (2) magnetic separation of ferrous metals, (3) air classification, (4) drying of shredded refuse, (5) screening of dry material, (6) aluminum recovery, (7) secondary shredding, (8) flash pyrolysis, and (9) collection of pyrolytic products. The major processes are described in full, including feed preparation, glass recovery, aluminum recovery, and pyrolysis. The recovered products are discussed along with a review of the project economics as well as a projected installation procedure for Bridgeport, Connecticut SCS

**A77-47216** Fluidized-bed incineration of waste materials. J. E. Hanway, Jr. (Beamer/Wilkinson and Associates, Oakland, Calif.). In: Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R.I., July 8, 9, 1975. Westport, Conn., Technomic Publishing Co., Inc., 1976, p. 261-279.

Fluidized-bed incineration of municipal solid wastes is described in terms of technical considerations, possible applications, and economics. Specific attention is given to the hardware, temperature parameters, methods of heat recovery, and treatment of exhaust gases. Among the possible applications are the incineration of municipal sludge, solid refuse, and coal combustion. The method's economics are computed for capital, operational, and net costs, and it is concluded that fluidized-bed incineration is a simple, reliable, and economical method which permits adaptability to the treatment of almost any type of waste that can be thermally oxidized or incinerated, and also provides the capability to tolerate a wide range of operating conditions SCS.

**A77-47218** Methane production from solid waste. R. G. Kispert, S. E. Sadek, and D. L. Wise (Dynatech R/D Co., Cambridge, Mass.). In: Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R.I., July 8, 9, 1975. Westport, Conn., Technomic Publishing Co., Inc., 1976, p. 315-332. 21 refs. NSF Grant No. C-827.

The process description for the anaerobic production of methane from solid waste consists of (1) feed preparation, (2) digestion, (3) gas treatment and handling, and (4) effluent disposal. An economic analysis of the procedure develops a computer model, reviews the system advantages and disadvantages, and calculates the cost of gas and of methane at baseline conditions. A sensitivity study and a forecast of the potential impact of the system are reviewed along with an evaluation of the process design, economics, and future plans. It is concluded that waste-produced methane may have a significant impact as a supplemental source of pipeline-quality gas and that anaerobic digestion of the organic portion of municipal refuse is currently the only known process for energy recovery in this form SCS

**A77-47220** Modern incineration - A proven way for recovery of energy and metals. C. A. Rogus. In: Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R.I., July 8, 9, 1975. Westport, Conn., Technomic Publishing Co., Inc., 1976, p. 351-357.

**A77-47222** Steam recovery - An alternative for intermediate size regions. R. H. Stephens (Arthur D. Little, Inc., Cambridge, Mass.). In: Energy from solid waste utilization, Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, Kingston, R.I., July 8, 9, 1975. Westport, Conn., Technomic Publishing Co., Inc., 1976, p. 387-418.

Regional planning for solid waste disposal is examined with particular reference to a group of Massachusetts towns. Alternatives, such as incineration, steam recovery, and resource recovery, are discussed and evaluated in terms of efficiency, costs, environmental impact (air pollution, ground water pollution, land use), and social impact (inflationary effects, employment benefits). It was concluded that for the particular region considered, both sanitary landfill and steam recovery were acceptable disposal techniques and were comparable in total direct operating costs. Sanitary landfill is a low capital investment with minor environmental impact, whereas steam recovery requires more capital investment, but supports local industry by supplying low-cost energy SCS

**A77-47271 #** The military utility of very large airplanes and alternative fuels. W. T. Mikolowsky (Rand Corp., Washington, D.C.), L. W. Noggle (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio), and W. L. Stanley (Rand Corp., Santa Monica, Calif.). *Astronautics and Aeronautics*, vol. 15, Sept. 1977, p. 46-56. 21 refs.

The paper describes a study with the objectives of evaluating very large airplanes (VLA's) in the context of existing and possible future Air Force missions and determining the most attractive alternative fuel for these airplanes. The chemical fuel alternatives considered are liquid hydrogen, liquid methane, and synthetic JP, each of which can be readily synthesized from coal. The nuclear-fueled VLA was a fourth candidate aircraft. The cost and energy effectiveness of these basic aircraft-fuel combinations in typical range, radius, and station-keeping missions was estimated. It was concluded that overall, a conventional hydrocarbon jet fuel remains the most attractive fuel for military aircraft. Nuclear propulsion is attractive only for station-keeping missions requiring large station radius. VLA's are especially attractive if the capability to airlift US forces world-wide without reliance on overseas bases is a major requirement PTH

**A77-47331 #** Idealization of complex dynamic systems with examples involving electrical energy systems (Idealizatsiia slozhnykh dinamicheskikh sistem s primerami iz elektroenergetiki). N. A. Kartvelishvili and Iu. I. Galaktionov. Moscow, Izdatel'stvo Nauka, 1976. 272 p. 32 refs. In Russian.

The work examines several ways to simplify dynamic systems of high dimensionality, thus making them observable and computable. The techniques of simplification include (1) the division of systems into fast, normal, and slow, (2) the replacement of lumped parameters by distributed parameters using a special critical transition, and (3) the averaging of the motion of a distributed parameter system with respect to spatial coordinates, thus replacing the three-dimensional system by two- or one-dimensional systems. Attention is given to the study of linear systems by the small parameter method and to the continuous idealization of dynamic systems. An electrical energy system is discussed as a classical example of a complex dynamic system B J

**A77-47347 #** Development of a small, low cost turbojet engine with thrust augmentation. W. C. Elrod, H. E. Wright, B. L. Wolfe, Jr., J. D. Durniak (USAF, Institute of Technology, Wright



Patterson AFB, Ohio), and D. B. Wilkinson (USAF, Aero-Propulsion Laboratory, Wright Patterson AFB, Ohio) In *The RPV - Complement to manned systems*, Proceedings of the Fourth Annual Symposium, Washington, D. C., June 5-9, 1977  
Dayton, Ohio, National Association for Remotely Piloted Vehicles, 1977, p. 89-95 7 refs

Turbosuperchargers from two manufacturers were successfully converted to turbojet engines, with engine run up from idle to maximum thrust while limiting the turbine inlet temperature to 1250 K. The smaller of the two turbosupercharge systems selected for conversion (designated J-1 and J-3 engines) was the first to be converted to a turbojet engine (the J-1 unit) and subsequently the conventional combustor was replaced with a catalytic reactor (then designated the J-3 unit). The J-3 engine weighed 13.15 kg (29 lb-m) excluding the oil system and produced 133N (30 lb-f) thrust with a turbine inlet temperature of 1250 K while operating on hydrogen as a fuel. The larger turbosupercharger designated the J-2 unit operating with JP-4 as a fuel and limiting the turbine inlet temperature to 1250 K produced 330 N (74.5 lb-f) thrust dry and 483 N (109 lb-f) with afterburner. The thrust specific fuel consumption ranged from 2.2 to 3.6 (Author)

**A77-47355** Symposium on Clean Fusion, 1st, Washington, D. C., April 30, 1976, Proceedings. Symposium sponsored by the Fusion Energy Corp. Edited by B. C. Maglich (Fusion Energy Corp., Princeton, N.J.) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977 91 p

Problems associated with the generation of electric power from advanced-fuel fusion reactors are discussed. Clean fusion processes which avoid the production of radioactive materials are reviewed, and various fuel fusions, such as those involving deuterium-fuel Tokamak reactors or laser plasma compression are described. The Migma prototype reactor systems, which rely on ion collision to achieve controlled fusion, are emphasized. In particular, difficulties involved in controlling the velocities and energy distributions of electrons used in neutralizing the ions of a Migma reactor are treated, and a generalized efficiency criterion for fusion reactors is developed to supplant Lawson's Criterion. The integration of fuel fusion plants into existing electric power distribution and transmission networks is also discussed J. M. B.

**A77-47356** Clean fusion concepts and efforts - A survey. R. W. B. Best (EURATOM and Stichting voor Fundamenteel Onderzoek der Materie, Instituut voor Plasmafysica, Jutphaas, Netherlands) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D. C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977, p. 1-7 24 refs. Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek and EURATOM.

Fusion reactors as presently conceived are breeders of tritium and, possibly, plutonium as well, a single reactor produces hundreds of tons of radioactive waste per year. Comparatively clean fusion fuels which avoid the production of radioactive matter are reviewed, together with the physical concepts how these fuels can be burnt. The main problems are bremsstrahlung and ion cooling in the presence of electrons, and low power density in the absence of electrons. Laser compression of pellets of a mixture of protons and boron 11 may be a solution when lasers in the megajoule range become available. Other valuable research and development efforts are clamped beam-plasma devices, the Migma cell, and direct converters (Author)

**A77-47357** Studies of deuterium-fueled Tokamak reactors. G. H. Miley, F. H. Southworth, G. Gerdin, and C. Choi (Illinois, University, Urbana, Ill.) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D. C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977, p. 9-16 22 refs. Research supported by the Electric Power Research Institute.

The importance of using non deuterium-tritium (D-T) fusion fuels is reviewed. Deuterium-deuterium (D-D) operation where product He-3 and tritium are burned at the same rate as produced

(called 'catalyzed-D') is identified as the only advanced fuel that avoids breeding of fuels and yet potentially offers operation under conditions achievable by present magnetic confinement devices. The conceptual design of a Tokamak reactor using catalyzed-D indicates a relatively large reactor, but this could still be quite attractive due to potential improvements in efficiency, reduced radioactivity inventory, and increased first-wall lifetime. While a number of uncertainties remain, the feasibility of such a reactor does not appear to be too great an extension beyond D-T reactors. Although fuels involving heavier elements could offer further advantages by essentially eliminating neutrons and tritium, suitable methods of confining and burning them require a much larger extrapolation of current experience (Author)

**A77-47358** Advanced fuel nuclear reaction feasibility using laser compression. I. H. Hora (New South Wales, University, Kensington, Australia) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D. C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977, p. 17-25 53 refs. Australian Research Grants Committee Grant No. B75/15538.

While the most advanced concept of magnetic field confinement, the Tokamak, may never be used for advanced clean fuel reactions with HB-11 or similar nuclei because of high loss cyclotron radiation and the high laser energies required, one possible design (besides the Migma type) is the utilization of laser plasma compression resulting from the nonlinear forces of laser-plasma interaction. The much higher efficiency of transferring laser energy into kinetic energy of thick moving plasma layers at low losses due to thermalization, involves laser energies of megajoules (or less when reheat is taken into account) for HB-11 reaching reaction gains of 80. The possibility of ideally adiabatic compression of the plasma is described and the different origins of nonlinear forces by dielectric swelling or by a new mechanism of short-range relativistic self-focusing are explained (Author)

**A77-47359** Advanced fuel nuclear reaction feasibility using laser compression. II. R. Castillo, I. H. Hora, E. L. Kane, V. F. Lawrence, M. B. Nicholson-Florence, M. M. Novak, P. S. Ray, J. R. Shepanski, R. I. Sutherland, and A. I. Tsivinsky (New South Wales, University, Kensington, Australia) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D. C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977, p. 27-48 48 refs. Australian Research Grants Committee Grant No. B75/15538.

Several problems are considered in studying the properties of the nonlinear-force compression of plasmas by lasers used to reach conditions for advanced clean-fuel nuclear reactions as well as to distinguish from gas-dynamic compression. The propagation of light in inhomogeneous media is based on a simpler, computationally economic program. The Goos-Haenchen effect (1947) is used for discussions of wave propagation and a laser amplifier without superradiance is designed. Corrections for alpha reheat are derived and a very short-range relativistic self-focusing with relatively low thresholds is discussed. Entropy production and electron-radiation interaction are treated relativistically (Author)

**A77-47360** The 1976 status of the Migma program of controlled fusion. B. C. Maglich (Fusion Energy Corp., Princeton, N.J.) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D. C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977, p. 33-42.

The Migma fusion reactor design, which aims at achieving controlled fusion in intersecting ion orbits, is discussed, with emphasis on techniques used to eliminate random particle motions and Maxwellian distributions of the electrons employed in increasing ion density. Plasma density and confinement times attained for previous designs of the Migma type are reviewed, in particular, confinement times of 2 sec have been reported. The flux lines of the Migma magnetic field, which may be considered a focusing mirror, are described, and suppression of end losses, multiple Coulomb scattering and charge transfer are considered. Factors controlling the distribution of electron velocities are also mentioned J. M. B.



**A77-47361** Impact of advanced fuel fusion on electric power transmission R W de Mello, N Dag Reppen, R J. Ringlee, and D D Wilson (Power Technologies, Inc., Schenectady, N Y) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug 1977, p 43-48 13 refs

The problems of integrating fuel fusion plants into electric power production and distribution systems are discussed Siting and transmission-line requirements for advanced fuel fusion plants are analyzed with reference to the plant-site selection procedures and transmission costs associated with nuclear fission light-water reactor (LWR) plants and coal-fired fossil-steam plants Difficulties related to fusion techniques that involve direct conversion to d c power, such as the need for additional reactor instrumentation and the control of voltage waveforms, are also considered It is suggested that direct-conversion fusion-steam plants could be located in urban areas to reduce transmission costs J M B

**A77-47362** Advanced fuel fusion experimentation with Migmaccells II and III - Orbit diagnostics and lifetime measurements S C Menasian, J Ferrer, B C Maglich, M G Mazarakis, J E. Nering, C Powell, J Sandberg, and A R Whittemore (Fusion Energy Corp., Princeton, N J) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug 1977, p 49, 50

Using both destructive and nondestructive diagnostic techniques, the number of stored ions, the distribution of ions among single particle orbits, the confinement times for stored particles and the fraction of molecular deuterium (+) ions dissociated during the first passage through the Migmaccell are determined Results from Migmaccell II experiments show lifetimes of 10 ms for ten to the 9th power stored deuterons at a background pressure of 4 to the negative 7th power torr air Migmaccell III experiments to date have demonstrated confinement times of 2 s in an unbaked ultra-high vacuum system The number of stored particles observed to date is in excess of ten to the tenth power Migmaccell III particle distributions are strongly peaked at the center of the cell, indicating a significant amount of beam-Migma dissociation (Author)

**A77-47363** Fusion products detection system in Migmaccell II J C Ferrer, B C Maglich, M G Mazarakis, S C Menasian, J E Nering, C W Powell, and A R Whittemore (Fusion Energy Corp., Princeton, N J) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug 1977, p 51-56

To observe the proton-triton branch of the deuterium-deuteron and deuterium-deuteron fusion reaction at an energy of 0.55 MeV in Migmaccell II, three 50-mm square Si surface barrier detectors were installed at 120 deg, -60 deg and -90 deg relative to the incoming deuterium(+) beam Results of an experiment where the background deuterium gas pressure was controlled at around 1.2 times 10 to the negative 5th power torr are presented A computer simulation program has been developed to understand the shapes of the observed spectra Proton counting rates obtained yield a Migma number of 600 million trapped ions in the cell (Author)

**A77-47364** Methods of 'tailoring' ion distributions in phase space /morphodynamics/ S R Channon (Fusion Energy Corp., Princeton, N J) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug 1977, p 57-62.

The control of ion distributions in Migma-type fusion reactors is considered, with the aim of forestalling instabilities and maximizing fusion rate relative to energy losses A description of the ion distribution which reduces the degrees of freedom dealt with and allows for a ready analysis of angular momentum and axial amplitude in terms of energy is given The use of an oscillating electron space charge for shaping the ion distribution is discussed, and the problems associated with characterizing ion orbits during electron oscillations are also treated In particular, use of an orbital model topologically equivalent to the actual orbit is suggested as a means of circumventing the lengthy process of ensemble-averaging J M B.

**A77-47366** Conditions for a boron fusion reactor in the MeV range J R Treglio (Fusion Energy Corp., Princeton, N J) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug 1977, p 65-68. 5 refs

**A77-47367** Advanced fuel fusion application to manned space propulsion R Ho (Fusion Energy Corp., Princeton, N J) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D C., Apr 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug 1977, p 69-72 7 refs

The use of a Migmaccell fusion device in the propulsion of manned spacecraft is discussed The advantage of Migmaccells serving as combined energy plants and ion thrusters (termed 'Migma direct ejection systems') include low mass-to-power ratios, high d.c. outputs, and the absence of neutron production Components of a fuel fusion Migmaccell applicable to spacecraft are described, and mass estimates for the required vacuum chamber, particle accelerator, energy storage system and cryogenic refrigeration system are given Typical missions to Mars and Pluto are considered in a comparison of fission electric and Migma direct ejection systems, the Migma direct ejection method is shown to involve lower fuel consumption and shorter flight times J M B

**A77-47368** Generalized criterion for controlled fusion. R. A. Miller (Fusion Energy Corp., Princeton, N.J.) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D.C., Apr. 30, 1976*) *Nuclear Instruments and Methods*, vol 144, July-Aug. 1977, p 73-76

The modification of Lawson's Criterion for characterizing the feasibility of energy production in a fusion reactor is discussed In particular, a generalized criterion for assessing the efficacy of Migma-type reactors is described Considerations involved in developing the modified criterion, which is essentially a balance of energy investment and energy return, include the different mechanisms of ion and electron heating, bremsstrahlung and synchrotron radiation, ion charge transfer, multiple Coulomb scattering and secondary fusion reactions A typical plot of the product of density and confinement time versus ion energy for a deuterium-deuteron fuel, derived in accordance with the generalized criterion, is given J M B.

**A77-47369** Unified criterion for proximity to controlled fusion. B C Maglich (Fusion Energy Corp., Princeton, N.J.) (*Fusion Energy Corp., Symposium on Clean Fusion, 1st, Washington, D.C., Apr. 30, 1976*) *Nuclear Instruments and Methods*, vol. 144, July-Aug 1977, p 77-80

A fusion reactor feasibility criterion which incorporates a number of loss terms not represented in the conventional Lawson's Criterion is described This unified criterion has the advantage of expressing in relatively simple terms the efficiency of conversion of external energy into ion fuel energy. The role of ion heating efficiency and the recovery of nonfused ion energy in a Migma-type reactor, as well as determination of optimum plasma density and confinement times, are analyzed by means of the unified criterion Sample calculations for fusion reactions taking place at thermo-nuclear temperatures and for high-energy advanced-fuel fusion are given J M B

**A77-47421** Some problems involved in the development of a solar thermionic power plant E. I. Grigor'ev, V M. Zaitsev, M. V. Mel'nikov, O A. Nevezhin, V S Ovchinnikov, V P Poluektov, S. V. Riabikov, I M Rubanovich, S A Kudiakov, and E. M. Iurin (Vsesoyuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). (*Geliotekhnika*, no. 2, 1977, p. 9-16) *Applied Solar Energy*, vol 13, no. 2, 1977, p 6-10. Translation

Apparatus is described for testing thermionic converters in laboratories or in the presence of solar radiation Experiments involving high-temperature steady-state systems are explained Volt-ampere characteristics, the effect of cathode temperature, the relation between incident and converted energy, and the effect of the reflection coefficient of the mirror were studied M L

**A77-47423** Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators. B. A. Bazarov, V. M. Kapeliushnikov, and B. A. Kalinin (Akademiia Nauk Turkmensoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR) (*Geliotekhnika*, no 2, 1977, p. 25-29.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 17-20, 7 refs Translation.

The integral energy distribution of moldings of a solar energy concentrator was compared with that of the original as a method of assaying the precision of duplication. The original was made of glass. The copies were made of polyurethane foam combined with either mosaic glass or polytetrafluoroethylene reflecting films. Short-circuit currents, concentrating capacities, diameters of the focal spots, and the extent of precision are compared. M L

**A77-47424** Concentration of diffuse radiation. V. K. Baranov. (*Geliotekhnika*, no 2, 1977, p. 30-36.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 21-25, 5 refs. Translation.

A parabolic-toroid solar concentrator and a parabolic-cylindrical solar focusing lens are described. The ability of these focusing devices to concentrate diffuse light from a large source, as from the sun, is considered. An analytical relationship is obtained for the average flux density in the small aperture in terms of the flux density incident at the large aperture. In comparison with lens systems, the focusing concentrator concentrates a much larger amount of diffuse light.

M L

**A77-47425** Analyzing multifacet concentrating systems. R. A. Zakhidov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe Biuro Nauchnogo Priborostroeniia, Tashkent, Uzbek SSR) and A. Sh. Khodzhaev (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). (*Geliotekhnika*, no 2, 1977, p. 37-42.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 26-30, 17 refs Translation.

Calculation procedures for faceted solar concentration systems are analyzed. The distribution of illumination in the focal volume of the long-focus mirror or facet is studied. The plane in which maximal illumination is obtained does not in general coincide with the focal plane of the facet, since the position of the plane depends on the angle between the facet and the light source. Methods for calculating facet focal parameters are proposed.

M L

**A77-47426** A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators. D. I. Teplakov and R. R. Aparisi (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR) (*Geliotekhnika*, no 2, 1977, p. 43-55.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 31-39, 9 refs. Translation.

A graphic method of calculating the illumination on cylindrical receivers and steam generators is presented and demonstrated for planar axisymmetric and planar eccentric arrangements. Daily thermal deviations in the ray-receiving surface are caused by changes in the geometry and magnitude of direct solar radiation. M L

**A77-47427** Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem. I. A. Rozhkov and V. A. Grilikhes (*Geliotekhnika*, no. 2, 1977, p. 56-63.) *Applied Solar Energy*, vol. 13, no. 2, 1977, p. 40-44, 7 refs Translation.

**A77-47428** Investigation of solar absorption cooler for round-the-clock operation. A. T. Vakhidov and T. M. Maksudov (Samarkandskii Kooperativnyi Institut, Samarkand, Uzbek SSR) (*Geliotekhnika*, no 2, 1977, p. 64-67.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 45-47 Translation.

A solar refrigeration unit using a water-ammonia solution is described. The variation of temperature and pressure parameters during continuous operation is examined, and the different events occurring in the presence or absence of illumination are explained.

M L

**A77-47429** Development and testing of solar water-heater boilers fabricated by diffusion welding. G. Ia. Umarov, F. Soatov, R. R. Avezov, Iu. M. Sigalov, and N. I. Koriagin (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). (*Geliotekhnika*, no 2, 1977, p. 68-70.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 48, 49 Translation.

**A77-47430** Residential solar heating in Uzbekistan. L. F. Aksenov, I. Ia. Viron, R. R. Avezov, O. L. Shvaleva, and A. M. Gafurov (Uzbekskii Nauchno-Issledovatel'skii Institut Gradostroitel'stva, Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) (*Geliotekhnika*, no 2, 1977, p. 71-74.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 50-52, 5 refs Translation.

**A77-47431** Simulation algorithms and their realization by digital computer for calculation of wind- and solar-plant storage-service capacity. R. B. Salieva (Tashkentskii Elektrotekhnicheskii Institut Sviazi, Tashkent, Uzbek SSR) (*Geliotekhnika*, no 2, 1977, p. 75-83.) *Applied Solar Energy*, vol 13, no. 2, 1977, p. 53-58, 6 refs Translation.

**A77-47600** Geothermal energy - Tapping nature's boiler room. R. B. Aronson. *Machine Design*, vol 49, Sept 8, 1977, p. 28-30, 32-34.

An analysis of possible applications of geothermal energy is presented, including several non-electric projects such as home and space heating, mineral recovery, desalination plants, aquatic farming, and waste processing. The location and evaluation of geothermal reservoirs is outlined in terms of drilling, fluid supply, and subsidence. Geothermal hardware is described, along with the identification of potential ecological problems, and three sources of obtaining geothermal energy are studied: the magma, hydrothermal, and hot dry rock systems. Possible power systems are discussed (the flashed steam, binary, and total flow systems) together with institutional problems of a legalistic nature. S C S

**A77-47749** Predicting the rate of warming of rivers below hydroelectric installations. R. W. Troxler (Georgia, Dept of Natural Resources, Atlanta, Ga.) and E. L. Thackston (Vanderbilt University, Nashville, Tenn.) *Water Pollution Control Federation, Journal*, vol 49, Aug 1977, p. 1902-1912, 6 refs.

The construction and verification of an energy budget model is described for the accurate prediction of temperature changes in flowing rivers based on the approximate geometry of the rivers, and data from first order weather stations. The results of five field surveys to test the model show that (1) atmospheric radiation and back radiation almost balance each other, (2) evaporation and conduction energy transfers are of minor importance, and (3) solar radiation accounted for almost all of the energy transfer. When the river was above the equilibrium temperature it was shown that (1) back radiation would be greater, (2) evaporation and conductive heat transfer would be negative, and (3) the total energy transfer would be negative. S C S

**A77-47751** # Closed costs of electrical energy for different zones of load graphs of electrical energy systems (O zamykaiushchikh zatratkh na elektroenergiu dlia razlichnykh zon grafikov nagruzki elektroenergeticheskikh sistem) A. N. Zeiliger, V. S. Sharygin, and E. I. Ergardt. *Akademiia Nauk SSSR, Izvestia, Energetika i Transport*, July-Aug 1977, p. 3-9, 7 refs. In Russian.

**A77-47752** # An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system (Ob odnom algoritme reshenia zadachi optimal'nogo upravleniia perakhodnymi protsessami v elektroenergeticheskoi sisteme) V. A. Venikov, V. A. Stroeve, and M. A. Taufik. *Akademiia Nauk SSSR, Izvestia, Energetika i Transport*, July-Aug 1977, p. 17-26, 10 refs. In Russian.

**A77-47753 #** Experimental study of several modes of operation of a laboratory section of a three-phase superconducting power transmission cable (Eksperimental'nye issledovaniia nekotorykh rezhimov raboty laboratornogo uchastka trekhfaznogo sverkhprovodiaschego energeticheskogo kabelia). N T Bendik, E S Gol'denberg, and M Ia. Kuno *Akademii Nauk SSSR, Izvestiia, Energetika i Transport*, July-Aug. 1977, p. 76-85 5 refs In Russian

**A77-47765** The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study I Rubinstein, O P Strausz, C Spyckerelle, R J Crawford, and D W S Westlake (Alberta, University, Edmonton, Canada) *Geochimica et Cosmochimica Acta*, vol 41, Sept 1977, p 1341-1353 43 refs Research supported by the National Research Council

**A77-47848** The future of hydrogen as an energy source (L'avenir énergétique de l'hydrogène) P Hagenmuller (Bordeaux I, Université, CNRS, Laboratoire de Chimie du Solide, Talence, Gironde, France) *La Recherche*, vol 8, Sept 1977, p 756-768 10 refs In French

Procedures for using hydrogen as an energy source are discussed with attention to economic costs A general scheme for obtaining hydrogen from the nuclear-powered electrolysis of water is presented, and the advantages and disadvantages of electrolytic and thermochemical procedures are examined Among the thermal cycles considered are the oxidation of steam by chlorine, the oxidation of CO by steam, processes using transition element oxides, the hydrolysis of halides, and hybrid cycles The characteristics of hydrogen and hydrides are compared Techniques for shipping and storing hydrogen are described, and problems of energy transmission are considered M L

**A77-47850** Solar energy - The good features of amorphous silicon (Energie solaire - Les promesses du silicium amorphe). I Solomon *La Recherche*, vol 8, Sept 1977, p 776, 777 9 refs In French

A procedure for producing films of amorphous silicon is described For unknown reasons, these films have a very low density of defects It is suggested that amorphous silicon will find application in solar energy devices Amorphous silicon films can be produced by subjecting SiH<sub>4</sub> to a high-frequency field, which causes the gas to become a plasma that decomposes and deposits Si on a substrate maintained at a controlled temperature The addition of phosphine to the SiH<sub>4</sub> leads to the development of an n-type film, while the addition of diborane leads to a p-type film Thus it is easy to prepare large area p-n junctions M L

**A77-47854** Degradation of solar cell efficiency by sheet resistance K Lehovc and A Fedotowsky (Southern California, University, Los Angeles, Calif) *Solid-State Electronics*, vol 20, Aug 1977, p 725, 726 Contract No E(49-18)-2457

**A77-47880** The effect of aerofoil characteristics on windmill performance R T Griffiths (Swansea, University College, Swansea, Wales) *Aeronautical Journal*, vol 81, July 1977, p 322-326 8 refs

An outline of the general design procedure for a modern high speed windmill is presented along with a review of how the aerodynamic characteristics of the blade section affect the power output The actual windmill performance is evaluated with regard to the interference factors, and the basic momentum considerations It is shown that airfoil characteristics have small effects on planform shape and twist, but large effects on performance Specifically, it is concluded that the maximum efficiency increases rapidly with a lift/drag ratio of up to approximately R = 30, thereafter increasing less quickly, and that the tip speed ratio also depends on the characteristic of the airfoil used S C S

**A77-47951** Thermal processing of municipal solid waste for resource and energy recovery N J Weinstein and R F Toro (Recon Systems, Inc., Princeton, N J) Research supported by the

US Environmental Protection Agency, Contract No 68-03-0293 Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976 198 p 117 refs \$20.

Thermal processing of municipal solid wastes, involving such processes as incineration and pyrolysis, is discussed, energy recovery programs associated with waste disposal, including waterwall incinerators, refuse/fossil fuel-fired boilers, are also mentioned The relative advantages of refractory, slagging, suspension-fired or fluidized-bed incinerators or pyrolysis plants are considered In addition, technical problems related to refuse/fossil fuel-fired steam boilers, including corrosion, erosion, fuel handling and air pollution control, are treated Capital and operating costs of refractory and steam-generating incinerators and other thermal processing units are compared Control of particulate and gaseous emissions, liquid and solid effluents, as well as marketing of by-products, is discussed

J M B

**A77-47958 \* #** Optimization of confinement in a toroidal plasma subject to strong radial electric fields. J. R Roth (NASA, Lewis Research Center, Cleveland, Ohio) *Institute of Electrical and Electronics Engineers, International Conference on Plasma Science, Troy, N.Y., May 23-25, 1977, Paper, 32 p.* 20 refs.

The toroidal ring of plasma contained in the NASA Lewis Bumpy Torus facility may be biased to positive or negative potentials approaching 50 kV by applying dc voltages of the respective polarity to 12 or fewer midplane electrode rings The radial electric fields, which are responsible for raising the ions to high energies by E x B/B-squared drift, then point out of or into the plasma A preliminary report is given on the identification and optimization of independent variables which affect the ion density and confinement time in the Bumpy Torus plasma The independent variables include the polarity, position, and number of the midplane electrode rings, the method of gas injection, and the polarity and strength of a weak vertical magnetic field Some characteristic data taken under conditions where most of the independent variables were optimized are presented The highest value of the electron number density on the plasma axis is 3.2 trillion per cu cm, the highest ion heating efficiency is 47%, and the longest particle containment time is 2.0 msec. (Author)

**A77-47960 \* #** The NASA thermionic-conversion /TEC-ART/ program J F Morris (NASA, Lewis Research Center, Thermionics and Heat-Pipe Section, Cleveland, Ohio) *Institute of Electrical and Electronics Engineers, Conference on Plasma Science, Troy, N.Y., May 23-25, 1977, Paper 18 p* 11 refs

The NASA program for applied research and technology in thermionic energy conversion is described, and the approaches used to obtain the goal of reduced interelectrode losses, improved emitters, and improved collectors are indicated The current emphasis on out-of-core thermionics allows materials and designs previously prohibited by in-core nucleonics and geometrics Since high-temperature material effects are important for several components, tungsten, 25%-rhenium technology is a subject of research Emitter-vaporization, collector-deposition effects were studied, and improvements in metallic-fluid heat pipes are considered Some required characteristics of electrodes are examined M L

**A77-47968 #** Flywheel hybrid power trains I - Component and drive selection II - Numerical optimization and operation R Saint Laurent and R C Flanagan (Toronto, University, Toronto, Canada) *Engineering Institute of Canada, Annual Congress, 90th, Halifax, Nova Scotia, Canada, Oct 5-8, 1976, Paper 61 p* 31 refs. Research supported by the National Research Council of Canada

Various components are considered for use in flywheel hybrid power trains for vehicles The cycle efficiency of a vehicle was defined with respect to a vehicle with an ideal power train The primary emphasis for component selection is placed on maximizing the cycle efficiency, hence fuel economy A double acting Stirling engine was chosen as the primary power source while a toroidal disk traction drive was chosen as the infinitely variable transmission The flywheel material selected was AISI 4340 steel Part II of this paper

uses the chosen components in a particular configuration of a hybrid commuter car. A computer optimization procedure is used to obtain the highest cycle efficiency. (Author)

**A77-47969 # Thermal energy management techniques in spacecraft design and their potential for terrestrial applications.** S Ahmed and V. A. Wehrle (Department of Communications, Communications Research Centre, Ottawa, Canada). *Engineering Institute of Canada, Annual Congress, 90th, Halifax, Nova Scotia, Canada, Oct 5-8, 1976, Paper. 32 p 24 refs*

Thermal energy management schemes derived from aerospace applications, including multilayer insulation, heat pipes, hollow glass microsphere insulation and surface finishes, are discussed. The operation of conventional, variable conductance and thermal diode heat pipes is described, terrestrial uses of heat pipes, such as stabilization of permafrost adjacent to Arctic oil pipelines, cooling of high-power electronic components, increasing the efficiency of domestic and commercial appliances and applications in solar energy collectors, are considered. The manufacture of multilayer blanket insulation for cryogenic to room temperature applications is described, and use of multilayer insulation in storage containers for liquefied gases is mentioned. Glass microsphere insulation for use in underwater environments, and surface finishes employed in solar heating and cooling of buildings are also discussed. J M B

**A77-47970 # Anaerobic sludge digestion - A potential energy source.** M F Hamoda and D B Cohen (Environment Canada, Wastewater Technology Centre, Burlington, Ontario, Canada). *Engineering Institute of Canada, Annual Congress, 90th, Halifax, Nova Scotia, Canada, Oct 5-8, 1976, Paper. 27 p 18 refs*

The anaerobic sludge digestion process is described, and gas production and utilization are discussed. The characteristics of bacterial action are examined, and single and two-stage systems are distinguished. About 10 to 20 cu ft of gas per pound of volatile solids digested are produced from a well-functioning digester. The digester gas contains about 60 to 70% methane by volume, CO<sub>2</sub> is the other main constituent. Methods of using digester gas for heating the contents of the digester (the most common usage of digester gas) are presented, and internal combustion engines or gas turbines that can use digester gas for power production are characterized. The future potential for gas utilization is considered with attention to economic factors. M L

**A77-47971 # Progress of feasibility reassessment of exploiting Fundy tidal energy.** R H Clark and R L Walker. *Engineering Institute of Canada, Annual Congress, 90th, Halifax, Nova Scotia, Canada, Oct 5-8, 1976, Paper. 43 p 9 refs*

A joint Canadian and provincial government program to assess the technical, environmental and economic feasibility of electrical power generation from tidal energy at the Bay of Fundy (Nova Scotia-New Brunswick) is reviewed. Aspects of the design process, including the choice between single and hydraulically-linked basin schemes, the integration of power plants into existing transmission systems, the development of a finite difference model for more accurate simulation of tidal flow, the estimation of capital costs for plants having capacities from 50 to 10,000 MW and the location and capacity of energy storage facilities, are considered. In addition, utility loads in the Canadian maritime provinces and Quebec through the 1990's are projected, and the relative cost of tidal energy from the proposed Bay of Fundy generating plants is estimated. J M B

**A77-48092 Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation.** F W Lautenschlaeger. *Energy Developments*, vol 1, Apr 1977, p 4-8

**A77-48099 A characterization of the sources of petroleum hydrocarbons in Lake Washington.** S G Wakeham (Washington, University, Seattle, Wash.). *Water Pollution Control Federation, Journal*, vol 49, July 1977, p 1680-1687. 29 refs. Contract No AT(45-1)-2225-T40

**A77-48100 Sludge processing to optimize digestibility and energy production.** R T Haug. *Water Pollution Control Federation, Journal*, vol 49, July 1977, p 1713-1721. 9 refs

A system for thermal pretreatment of primary and/or waste-activated sludge from wastewater treatment plants prior to anaerobic digestion is described along with a discussion of energy balancing and cost evaluation procedures. The system's potential advantages include (1) improved biodegradability, (2) an increase in net energy production, based on the increase in biodegradability and hence in gas, (3) improved dewaterability of residual solids to the extent that additional conditioning may not be required prior to dewatering, (4) no separate sidestream treatment, (5) effective odor control, and (6) production of pathogen-free sludge, thus alleviating public health concerns. S C S

**A77-48158 \* Symposium on Combustion (International), 16th, Massachusetts Institute of Technology, Cambridge, Mass., August 15-20, 1976, Proceedings.** Symposium sponsored by the Combustion Institute, U S Air Force, U S Navy, U S Army, ERDA, NASA, NSF, American Chemical Society, et al., NSF Grant No ENG-76-21419, Contracts No N00014-76-G-0041, No NAS3-19774, Grant No DAAD05-76-Q-5603. Pittsburgh, Pa., Combustion Institute, 1977. 1724 p. Members, \$37, nonmembers, \$60

Aspects of combustion technology in power systems are considered, taking into account a combustion in large boilers, the control of over-all thermal efficiency of combustion heating systems, a comparison of mathematical models of the radiative behavior of a large-scale experimental furnace, a concentric multiannular swirl burner, and the effects of water introduction on diesel engine combustion and emissions. Attention is also given to combustion and related processes in energy production from coal, spray and droplet combustion, soot formation and growth, the kinetics of elementary reactions, flame structure and chemistry, propellant ignition and combustion, fire and explosion research, mathematical modeling, high output combustion systems, turbulent flames and combustion, and ignition, optical, and electrical properties. G R

**A77-48159 Synthetic fuels and combustion.** J P Longwell (Exxon Research and Engineering Co., Linden, N.J., MIT, Cambridge, Mass.). In *Symposium on Combustion (International), 16th, Cambridge, Mass., August 15-20, 1976, Proceedings*. Pittsburgh, Pa., Combustion Institute, 1977, p 1-15. 22 refs

Particular attention in the discussion is given to the conversion of coal to liquid fuels for transportation use. The manufacture of synthetic fuels from coal involves a significant increase in the hydrogen-to-carbon ratio from the comparatively low value of the ratio found in coal. The relative fuel/engine system efficiency for both air and ground transportation is expected to be strongly influenced by the ability of an engine to burn low hydrogen-to-carbon ratio aromatic fuels without formation of carbon particulates, engine deposits, or maintenance problems. Improvement in the ability of aircraft engines to burn highly aromatic, wide boiling range fuels offers the possibility of advances in economics and fuel conservation in air transportation. G R

**A77-48169 NOx from fuel nitrogen in two-stage combustion.** F J Martin and P K Dederick (General Electric Co., Schenectady, N.Y.). In *Symposium on Combustion (International), 16th, Cambridge, Mass., August 15-20, 1976, Proceedings*. Pittsburgh, Pa., Combustion Institute, 1977, p 191-198

A description is presented of the two-stage combustion of gaseous fuel/air mixtures. In the primary stage, the fuel/air mixture is burned as an enclosed premixed, fuel-rich, turbulent jet. In the second stage, jets of dilution (secondary) air are injected into the hot primary products. An investigation is conducted regarding the conversion of NH<sub>3</sub> in the fuel to NO<sub>x</sub> in the products. It is found in all experiments that there is a decrease in the yield of NO<sub>x</sub> for the primary products with increasing equivalence ratio for rich mixtures all the way to the rich experimental limit. The results of the

investigation appear to be entirely consistent with a model reported by Fenimore (1972), at least in a semiquantitative way G.R

**A77-48172** Combustion technology for the improvement of engine efficiency and emission characteristics W Bernhardt (Volkswagenwerk AG, Wolfsburg, West Germany) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 223-232 23 refs

The fuel characteristics required for future engines are considered. It is found that future automotive Otto engines have the potential of comparatively low energy consumption which can be obtained by virtue of efficient lean operation and utilizing the high octane ratings of future fuels at high compression ratios. Future diesel engines preserve high fuel economy, while soot formation and odor are suppressed by utilizing methanol injection or using diesel-water emulsion. An employment of mathematical modeling as a tool for the development of combustion technology is discussed and a description of new methods for the improvement of fuel-air mixture preparation is presented. A new Inlet Manifold-Exhaust-Package (MEP) which integrates a lean thermal reactor is examined, giving attention to aspects of MEP evaluation, the thermal efficiency of MEP-equipped internal combustion engines, and the emission characteristics of a methanol engine G.R

**A77-48173** In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures E D Hirlman, Jr and S L K Wittig (Purdue University, West Lafayette, Ind) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 245-252, Comments, p 253, 254 26 refs Research supported by the Dammarks Teknisk-Videnskabelige Forskningsrad, NATO, and NSF

**A77-48175** Numerical model of coal gasification in a packed bed A M Winslow (California, University, Livermore, Calif) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 503-513, Comments, p 513, 514 20 refs Contract No W-7405-eng-48

A one-dimensional time-dependent computational model has been developed as a pilot study for the multidimensional simulation of coal gasification in a packed bed, treated as a porous medium. Different gas and solid temperatures are used, and concentrations of eight chemical species ( $N_2$ ,  $O_2$ ,  $H_2O$ ,  $H_2$ ,  $CH_4$ ,  $CO$ ,  $CO_2$ , tar) two forms of water (surface and interior), coal and char are followed in space and time. Numerical results obtained for gasification of a Wyoming subbituminous coal by a mixture of steam and oxygen show reasonable agreement with laboratory measurements. The numerical method retains all time derivatives and treats the nonlinear partial differential equations as an initial-value problem, using implicit methods which are capable of being extended to two or more space dimensions (Author)

**A77-48176** Kinetics of gasification in a combustion pot - A comparison of theory and experiment T Eapen, R Blackadar, and R H Essenhigh (Pennsylvania State University, University Park, Pa) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 515-522 15 refs Research supported by the Pennsylvania Science and Engineering Foundation, Contract No E(49-18)-2030

The reaction of carbon with air in a fixed fuel bed was investigated through analysis of rate equations and through data obtained from experiments involving a combustion pot. The combustion pot, a refractory box accommodating bed depths up to 18 inches, was fueled with various grades of coke or coal, experiments were carried out at air intake and gasification rates comparable to those employed by commercial gasifiers. Kinetic coefficients were obtained from slopes of log/linear plots of gas composition ( $O_2$ ,  $CO_2$  and  $CO$  were studied) with time. It was found that the carbon-air

reaction is diffusion-controlled in the combustion region of the fuel bed, but chemically-controlled in the gasification region, with a temperature coefficient equivalent to 50 kcal activation energy. Possible application of these results to mathematical models of shaft reactors, the Lurgi process, or underground gasification is also mentioned J.M.B

**A77-48177** Reaction rate analysis of borehole 'in-situ' gasification systems I M Stewart and T. F Wall (Newcastle, University, Newcastle, New South Wales, Australia) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 525-533 11 refs Research supported by the National Coal Research Advisory Committee

Two methods of in situ borehole coal gasification, the plug-flow reduction system and the well-stirred oxidation system, are studied. In particular, carbon gasification, strata losses and gas and surface temperatures for a range of coal properties, bed and moisture contents and blast conditions are investigated, and the relative influence of mass transfer and chemical reaction rate on the combustion processes is assessed. Computations describing the combustion reactions suggest that a plug-flow tapering reduction zone is dominated by mass-transfer effects and that a high gasification efficiency may be possible with an oxygen-steam blast and elevated combustion zone exit temperatures. For the well-stirred reactor model, a notable influence of moisture balance on ignition stability is found; in addition, it is concluded that an oxygen-steam blast with preheat could produce synthesis gas at high efficiency in a jet-stirred reactor J.M.B

**A77-48178** Environmental aspects of low Btu gas combustion. M P Heap, T J Tyson, J E Cichanowicz, R Gershman, C J Kau (Ultrasystems, Inc, Irvine, Calif), G B Martin, and W S Lanier (US Environmental Protection Agency, Research Triangle Park, N.C.) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 535-545 14 refs US Environmental Protection Agency Contract No 68-02-1361

A kinetic model describing the formation and destruction of nitrogen oxides was used to study two combined-cycle power plants burning ammonia-containing low-Btu gas derived from coal. The kinetic model, which includes more than 100 reactions, was validated by comparison with data for methane/air combustion in jet-stirred reactors. An advanced-technology high temperature gas turbine with a waste heat boiler and a supercharged boiler with a current-technology gas turbine were investigated via the model; it was concluded that staged combustion schemes involving rich primary zones could result in minimum nitrogen oxides emission levels of 105 ppm for the high-temperature turbine and 100 ppm for the supercharged boiler J.M.B

**A77-48240 \*** Direct-connect tests of hydrogen-fueled supersonic combustors P J Waltrup, G L Dugger, F S Billig, and R C Orth (Johns Hopkins University, Laurel, Md) In Symposium on Combustion (International), 16th, Cambridge, Mass, August 15-20, 1976, Proceedings Pittsburgh, Pa, Combustion Institute, 1977, p 1619-1629 8 refs NASA-supported research

Direct-connect tests of hydrogen-fueled supersonic combustors were performed using arc-heated air at combustor inlet Mach numbers of 2.9 to 3.2. Various axisymmetric combustor geometries of 5.89 and 6.96 cm (inner diameter) inlet were investigated; the fuel was injected from the wall either from a ring of equally spaced holes normal to the air stream, or from a circumferential slot oriented 45 deg downstream. The hole-type injectors, consistently gave better results. The effects of various parameters are examined, and the performance comparison procedure is described. A theoretical model of the supersonic combustion process which includes a pre-combustion shock-compression is used to explain the character of the observed pressure distributions and to assess the effects of the measured heat transfer rates, deduced wall shear, and combustor geometry on performance M.L.

**A77-48257** Solar energy installation for the project 'Motto di Lena' in Minusio/Tessin (Sonnenenergieanlage für das Objekt 'Motto di Lena' in Minusio/Tessin). E Ruosch (Eidgenössische Technische Hochschule, Landis und Gyr Zug AG, Zentralschweizerisches Technikum, Lucerne, Switzerland), B Laumann (Landis und Gyr Zug AG, Lucerne, Switzerland), A Grondler (Kampfer AG, Othmarsingen, Switzerland), and R Meuli *HLH - Zeitschrift für Heizung, Lüftung, Klimatechnik, Haustechnik*, vol 28, Aug 1977, p 289-294. In German.

The considered installation represents now probably the largest solar energy project in Switzerland. The project includes solar energy collectors with an area of 100 sq m and heat storage facilities, based on the use of water, with a volume of 225 cu m. The installation provides energy for heating five apartments and for supplying them with hot water. It was found that, during the first operational year, 72% of the entire energy required could be provided by solar energy. The remainder of the energy needed was supplied by an auxiliary electrical heating system. Attention is given to aspects of constructional design, details concerning the collection and utilization of solar energy, the costs of the system and its operation, and the evaluation of the obtained data. G R.

**A77-48258** The test reference year. A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun (Das Test-Referenzjahr: Eine Sammlung stündlicher Werte interessierender Wetterelemente. III - Umrechnung des Luftdruckes auf andere Höhen, Gleichungen der Dampfdruckkurve von Wasser, Berechnung des Sonnenstandes). A Jahn (Berlin, Technische Universität, Berlin, West Germany) *HLH - Zeitschrift für Heizung, Lüftung, Klimatechnik, Haustechnik*, vol 28, Aug 1977, p 295-299. 33 refs. In German.

A number of equations are required in connection with the evaluation and selection of data for a test reference year (TRY) and also in connection with the utilization of the TRY values. The required relations are presented for problem areas for which the corresponding information found in literature is insufficient or nonexistent. Measured data concerning the air pressure are generally converted to values corresponding to an altitude of zero before publication, while the data for temperature and relative humidity are given for the altitude of the climatological station. It is, therefore, often necessary to convert the published air pressure data again to the values corresponding to the station altitude. Suitable approaches for doing this are discussed. Attention is also given to water vapor pressure relations needed for the design of heating and air conditioning systems and to equations required in calculations which take into account the characteristics of direct solar radiation. G R.

**A77-48259** Energy savings obtained by applying the findings of construction physics II (Energieeinsparung durch Anwendung von Erkenntnissen der Bauphysik. II). H Reinders *HLH - Zeitschrift für Heizung, Lüftung, Klimatechnik, Haustechnik*, vol 28, Aug 1977, p. 300-304. 7 refs. In German.

The main problem in connection with the requirements for saving energy in the case of the heating or air conditioning of buildings is related to a minimization of the energy needed to provide and maintain physiologically appropriate conditions concerning the air in the rooms of a building. Theoretical studies and practical experience show that optimal relations are found in the case of an existence of quasi-stationary conditions with respect to the quality of the air in the rooms. The conditions for a thermal equilibrium in buildings are investigated and a description is presented of the results which have been obtained in a theoretical study of seven types of wall design. The effects of various building design factors on the loss of heat from the building are discussed. G R.

**A77-48267** Wind energy - Large and small systems competing. W D Metz *Science*, vol 197, Sept 2, 1977, p 971-973.

Windpower, which is available on an annual basis in amounts comparable to the average energy flux of sunlight in many areas, offers one of the most inexpensive means of producing energy. The

possibilities are investigated for utilizing features available in many windy regions, such as hydroelectric systems, capable of producing energy storage by holding back water while the wind is blowing, and underground gas formations, suitable for compressed air storage. Possible interference with television reception constitutes one of the major objections to wind installations, as television's synchronization speed, 30 cycles per second, is near the rotation speed of large wind systems. The use of fiber-glass blades is suggested as a partial remedy for the problem. Several existing wind machine programs are discussed with regard to construction, cost evaluation, effectiveness, and storage capacities. It is concluded that both large and small wind systems have the potential to compete with conventional electric systems. S C S.

**A77-48301** Is an electric vehicle in your future? E C Hackleman, Jr (Connecticut, University, Storrs, Conn.) *Environmental Science and Technology*, vol 11, Sept 1977, p 858-862.

The electric vehicle is suggested as an alternate solution to automotive pollution and energy problems. Among the advantages of the electric vehicle are fuel economy, low-operating costs, minimal maintenance, and low pollution emission. The major disadvantage of the electric vehicle is that the lead-acid battery wears out rapidly because of repeated recharges. Battery technology has developed several new products, such as the silver-zinc battery, the sodium-sulfur battery, and the lithium-sulfide battery, which are discussed. Potential markets for electric vehicles include both public and commercial transportation. It is concluded that although the electric vehicle has a limited application under current technological parameters, it has great potential for the future as an alternate to the internal combustion vehicle. S C S.

**A77-48472** Soluble-salt processes for in-situ recovery of hydrocarbons from oil shale. M Prats, P J Cloosmann, G Drinkard (Shell Development Co., Houston, Tex.), and A T Ireson (Shell Oil Co., Houston, Tex.) (*American Institute of Mining, Metallurgical and Petroleum Engineers, Annual Fall Technical Conference and Exhibition, 51st, New Orleans, La., Oct 3-6, 1976*) *Journal of Petroleum Technology*, vol 29, Sept 1977, p 1078-1088. 13 refs.

This paper describes a class of in situ shale-oil recovery processes in which permeability and porosity are developed by dissolution of soluble salts. These processes consist of two steps that may be conducted simultaneously or sequentially: leaching of soluble salts and conversion of kerogen. (Author)

**A77-48473** Underground coal gasification - A status report. L A Schrider and C E Whieldon (Morgantown Energy Research Center, Morgantown, W Va.) (*American Institute of Mining, Metallurgical and Petroleum Engineers, Eastern Regional Meeting, Columbus, Ohio, Nov 18-19, 1976*) *Journal of Petroleum Technology*, vol 29, Sept 1977, p 1179-1185. 14 refs.

Three in situ coal gasification techniques, the packed bed reactor approach for thick seams (50 ft or greater), the longwall generator concept for thin seams (15 ft or less), and the linked vertical well method for intermediate seams (15 to 50 ft), are described. The second Hanna experiment, which tested the linked well method, is discussed, with attention to the instrumentation techniques used. The results of the Hanna experiments show a marked improvement with each successive test as a result of higher injection rates and the backpressuring of the formation. These procedures have produced a favorable air/water ratio for in situ coal gasification. Phases 2 and 3 of Hanna experiment are compared. M. L.

**A77-48478** BI-gas pilot plant processes 5 tph. R A Weaver, Jr *Coal Mining and Processing*, vol 14, Sept. 1977, p. 86-88, 90, 122.

A process for the production of high-Btu pipeline gas from coal is described. Among the system's advantages are a high yield of methane, total consumption of feed coal, and the absence of tar and oil formation in the gasification process. The pilot plant design is outlined with attention to the individual support systems. Discussed in greater detail are (1) coal receiving and preparation, (2) the

high-pressure slurry-feed system, (3) the gasifier system, (4) the slag removal system, (5) gas clean-up, and (6) gas conversion. S.C.S.

**A77-48480** Space-based solar power study near completion. B M Elson *Aviation Week and Space Technology*, vol 107, Sept. 19, 1977, p 58, 59, 62-65, 68, 69.

The concept of solar power systems is discussed with regard to potential energy conversion schemes. Two such systems have been found to be equally effective for the project (1) photovoltaic devices (solar cells) which would convert sunlight directly into electricity by means of solar cell arrays scaled at about 100 sq km for a 10 GW output at the busbars on the ground, and (2) thermal engines (two versions of which are feasible at the present time, the closed Brayton cycle using helium as the working fluid, and the potassium vapor Rankine cycle) which would convert sunlight into electricity via turbomachinery rather than solar cells. Satellite construction techniques, cost evaluation, and flight experimentation are reviewed. S C S

**A77-48489** Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal. R Shaw, D. M. Golden (Stanford Research Institute, Menlo Park, Calif.), and S W Benson (Southern California, University, Los Angeles, Calif.) *Journal of Physical Chemistry*, vol 81, Sept 8, 1977, p. 1716-1729. 25 refs Contract No. E(49-18)-2202

**A77-48493** Antenna design for offshore satellite links. M R Braine (Marconi Communication Systems, Ltd., Chelmsford, Essex, England) *Microwave Journal*, vol 20, Sept 1977, p 59-61

A description is presented of the various factors which have to be considered in the design of an offshore antenna system that is to be installed on oil production platforms in the North Sea for communications applications involving a use of the European Communications Satellite. Attention is given to general design considerations, tracking and stabilization systems, error factors, radome options, and a performance/cost analysis. G R

**A77-48496** Further Stirling engine development work I (Weiterentwicklungen am Stirlingmotor. I) F Zacharias *Motor-technische Zeitschrift*, vol 38, Sept 1977, p 371-374, 377 17 refs. In German

Advantages of the Stirling engine, as obtained in experimental models, are related to high efficiency, a small amount of pollutants in the exhaust gas, and low operational noise levels. A survey is provided regarding the development trends of the engine, taking into account the thermodynamic conditions in the case of the double-acting engine. The Stirling engine makes use of heat exchangers and helium or hydrogen as operational medium. Attention is given to the operational phases in a 4-cylinder Stirling in-line engine, the necessity to employ higher process theory in connection with engine design studies, the pressure and temperature characteristics of the engine, and various process control techniques. G R

**A77-48502** Science and technology of oil shale. Edited by T F Yen (Southern California, University, Los Angeles, Calif.) Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976 232 p \$32 50

A systematic review of oil shale research is presented including papers which discuss U.S. oil shale deposits, modification of the mineral matrix by bioleaching, mild oxidation procedures for bioleaching oil shale, electrolytic oxidation and reduction of oil shale, and pulsed nuclear magnetic resonance for the estimation of potential oil yields. Retorting of oil shale is presented with regard to indexes for oil shale pyrolyses from ethylene/ethane ratios of product gases, and polycondensed aromatic compounds and carcinogens in shale ash of carbonaceous spent shale. Environmental concerns are outlined along with sulfur recovery in a biochemical method of oil shale production, microbial degradation of oil shale, and structural investigations of kerogen's hydrogen structure. S C S

**A77-48503** Wind power - Pipe dream or reality. F Hirschfeld *Mechanical Engineering*, vol 99, Sept 1977, p. 20-28

It has been estimated that the power which is potentially attainable from the surface winds over the U.S. is more than 30 times the probable total power consumption of the U.S. by 1980. However, attempts to utilize this resource for power generation applications in the past have generally not been economically successful. In connection with the energy crisis, the federal government has undertaken a program for the development of economical wind systems capable of providing up to 30 years of reliable, automatic, relatively maintenance free service. The program includes plans for the development of a 1.5-MW horizontal-axis, propeller-type experimental wind turbine generator with a composite rotor 61 m in dia. Attention is given to an experimental 100-kW unit, a review of prominent wind-power projects in the first half of the 20th century, the development and promotion of wind systems for farm and rural use, and questions of economic viability. G.R.

**A77-48517** # Energy output and service life characteristics of high-voltage low-temperature thermopiles (Energeticheskie i resursnye kharakteristiki vysokovol'tnykh nizkotemperaturnykh termobatarei) L D Dudkin, A N Moskalev, A. E. Nadzhip, O B Sokolov, and A Ia Terekov (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR) *Geliotekhnika*, no 3, 1977, p 3-7 In Russian

The article discusses the design of low-temperature high-voltage thermopiles featuring a high ratio of output voltage to unit power drain U/W (ratio roughly ten) capable of operating at temperatures from 50 to 300 C over a 200 C temperature drop. Extruded rods of low-temperature thermoelectric materials with such a ratio are used in fabricating the thermopiles. 4000-h lifetime tests run on specimens with hot-junction temperatures near 270 C revealed no degradation of thermopile energy output or performance. R D V

**A77-48518** # Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions (Fotoelektricheskie i elektricheskie svoistva nSiC-nCdS-geteroperekhodov) Sh A Mirsagatov, M Duisenbaev, and D T Rasulov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) *Geliotekhnika*, no 3, 1977, p 8-11 5 refs In Russian

Dark voltage-current and voltage-capacitance characteristics of n-type (SiC + CdS) heterojunctions were investigated, in order to ascertain the mechanism of current transport through the structure. The heterojunctions were fabricated by thermal vaporization of CdS powder in vacuum and sputtering onto alpha-SiC specular surfaces. Metallic contacts to the CdS films were applied by sputtering of In and Au Ohmic contacts to the SiC were fashioned by fusing a mixture of Ni + W powders. Spectral dependences of photo-sensitivity, photo-emf, and short-circuit current (on intensity of incident light) were taken. R D V

**A77-48519** # Procedure for calculating thermocompressor thermodynamical parameters (Metodika rascheta termodinamicheskikh parametrov termokompressora) A G Popov and V S Trukhov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) *Geliotekhnika*, no 3, 1977, p 12-19 7 refs In Russian

A procedure for calculating the thermodynamical performance characteristics of a thermocompressor operating on a modified Stirling cycle is worked out. An ideal thermocompressor model is developed, with constant temperatures in hot and cold zones, identical masses of working fluid taken in and exhausted over a cycle at constant pressures, no leaks, no friction, no drag, and with an ideal regenerator. Design with rod diameter taken into account and left out of account are considered. The thermal efficiency of the ideal thermocompressor is found to increase with compression ratio and to decline when monatomic working fluid is replaced by diatomic. R D V

**A77-48521** # Shortened focusing concentrators and focusing wedges (Ukorochennyye fokony i fokiliny) M V Braslavskaya and V K Baranov *Geliotekhnika*, no 3, 1977, p 25-30 In Russian

Graphs and tabular data are presented on the parameters of parabolic torus solar energy concentrators and parabolic cylinder



focusing wedges. Straightforward determination of the performance parameters of shortened focusing concentrators and focusing wedges as functions of specified element depth or allowable degradation of concentration ratio is addressed. Spatial selectivity and aperture dimensions of the solar array elements are defined and formulated. Shortening a concentrator by a third, and a wedge by a half, is found to result in only 10% degradation in concentration. R D V

**A77-48522 # Contribution to procedures for testing Silazan resin coatings (K metodike ispytani silazanovykh pokryti)** R A. Zakhidov, A I Ismanzhanov, and L A. Dubrovskii (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR) *Geliotekhnika*, no 3, 1977, p 31-35 6 refs. In Russian

Procedures for accelerated ageing tests on Silazan resin protective coatings and statistical processing of test data are outlined. Resin coatings on solar concentrators are tested under various intensified solar UV radiation patterns simulating five-fold or forty-fold UV intensities. Mercury lamps are employed in the accelerated exposures. Parameters for the accelerated ageing tests, functions linking the lifetime and operating conditions of the coated object, and conversion of test results are discussed. R D V

**A77-48523 # Radiative heat transfer in cavity type axisymmetric collectors for high-temperature solar energy plants (Luchisty teploobmen v polostnykh osesimmetrichnykh priemnikakh vysokotemperaturnykh solnechnykh ustanovok)** R A Zakhidov and Sh I Klychev (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR) *Geliotekhnika*, no 3, 1977, p 39-44 7 refs. In Russian

Radiative heat transfer in cavity type solar collectors was investigated with the object of arriving at useful simplifications in early-design selection of cavity parameters. A computer program is developed and the effect of optical-geometrical cavity parameters on heat flux is investigated, with attention given to the concentration field. Relationships between influx distribution and redistributions of outward-going flux are explored. R D V

**A77-48525 # Experience in constructing a solar energy cadastral survey (Opyt postroeniia gelioenergeticheskogo kadastra)** R B Salieva (Tashkentskii Elektrotekhnicheskii Institut Sviazi, Tashkent, Uzbek SSR) *Geliotekhnika*, no 3, 1977, p 56-64 18 refs. In Russian

Basic purposes of a solar energy cadastral survey incorporating objective numerical data based on an adequate stochastic model are outlined. The survey is intended to provide a data base for exploitation and storage of solar energy and for forecasting of favorable insolation conditions, with benefits in electric power, communications, refrigeration and heating, irrigation, and water resources management. The microstructure of solar radiation exposure is broken down from a continuous series to phase-homogeneous periods lasting one calendar month. Histograms, tables, and graphs are compiled as aids in determining repeatability of solar radiation patterns. R D V

**A77-48570 # A simple physical model of a magneto-hydrodynamic generator (Prostreshara fizicheskaiia model' magnitogidrodinamicheskogo generatora)** I Ia Plotnikov (Akademiia Nauk SSSR, Institut Kosmofizicheskikh Issledovani i Aeronomii, Yakutsk, USSR) *Geomagnetizm i Aeronomiia*, vol 17, July-Aug 1977, p 772, 773. In Russian

A physical model is developed to study the ambiguity of the MHD approximation caused by the effects of the density of the vortical and static electromotive force. A stationary shear flow is constructed whose vortex lines are directed along an applied magnetic field with the shear flow formed by two parallel walls of a rectangular tube. The profile of the Couette flow obtained reveals the character of the local interaction of the magnetic field and the vortex flow where the magnetic field facilitates deceleration and reversal of the stream in the region of the stationary wall. S.C.S

**A77-48571 # MHD power generation with fully ionized seed** H Yamasaki and S Shioda (Tokyo Institute of Technology, Tokyo, Japan) *Journal of Energy*, vol 1, Sept-Oct 1977, p 301-305 13 refs

Recovery of power density in the regime of fully ionized seed has been demonstrated experimentally using an MHD disk generator with the effective Hall parameter up to 5.0 when the seed was fully ionized. The experiments were conducted with a shock-heated and potassium-seeded argon plasma under the following conditions: stagnation gas pressure = 0.92 atm, stagnation gas temperature = 2750 K, flow Mach number = 2.5, and seed fraction =  $1.4 \times 10^{-5}$ . Measurements of electron number density and spectroscopic observations of both potassium and argon lines confirmed that the recovery of power output was due to the reduction of ionization instability. This fact indicates that the successful operation of a disk generator utilizing nonequilibrium ionization seems to be possible and that the suppression of ionization instability can also provide higher adiabatic efficiency. Furthermore, the lower seed fraction offers technological advantages related to seed problems. (Author)

**A77-48647 # Thermal properties of subsurface rocks in the Ukraine (Teplovyie svoystva pripoverkhnostnykh porod territorii Ukrainy)** V V Gordienko and O V Zavgorodniaia (Akademiia Nauk Ukrainskoi SSR, Institut Geofiziki, Kiev, Ukrainian SSR) *Geofizicheskii Sbornik*, no 76, 1977, p 82-86 8 refs. In Russian

Temperature measurements at depths of 0.2 and 3.2 m and determinations of the volumetric specific heat for subsurface rocks were obtained. Values of the thermal diffusivity (average, 7 times  $10^{-5}$  to the minus third  $\text{cm}^2/\text{sec}$ ) and of the heat conductivity (2 times  $10^{-1}$  to the minus third  $\text{cal}/(\text{cm} \cdot \text{deg} \cdot \text{sec})$ ) are presented. In general, the results agree with earlier data. Applications of the data are considered. M L

**A77-48701 Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings. Volumes 1 & 2** Conference sponsored by ANS, SAE, ACS, ASME, AIAA, IEEE, and AIChE. La Grange Park, Ill., American Nuclear Society, Inc., 1977. Vol 1, 1007 p, vol 2, 986 p. Price of two volumes, members, \$45, nonmembers, \$100.

The papers in this collection deal with continuing advances in the search for and development of new sources of energy and more efficient processes that consume energy. The topics cover a wide range, including advanced auto propulsion, alternative fuels, Brayton cycle engines, fluid bed combustion, geothermal and solar power systems, Rankine cycle engines, thermionics, and wind power.

P T H

**A77-48702 Comparing alternative methods of improving fuel economy** S Luchter and C J Daye (ERDA, Washington, D C) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 29-10 refs.

An analytical method is proposed that allows one to determine the effect of design changes on vehicle fuel economy. The method relates the energy required to accomplish the composite driving cycle to the inertia weight of the vehicle and a vehicle fuel consumption parameter. As examples of technology improvements, continuously variable transmission and aerodynamic drag reduction are considered. It is shown that weight reductions, when properly coupled to engine downsizing, can significantly improve fuel economy, especially for lighter-weight vehicles. Improvement in engine and drivetrain performances can likewise improve overall fuel economy, especially for heavier automobiles. P T H

**A77-48703 The ERDA automotive gas turbine program** C S Chen (ERDA, Div of Transportation Energy Conservation, Washington, D C) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 10-17.



The automotive gas turbine engine was examined for possible introduction during the 1980-1990 time period. Technical analysis was made of the gas turbine engine as alternative to the conventional engine. This alternative was evaluated from a societal point of view on terms of energy consumption, urban air quality, cost to the consumer, materials availability, and industry impact. The results show that the gas turbine engine offers the promise of eliminating the automobile as a significant source of urban air pollution, dramatically reducing fuel consumption, and being saleable. Specifically, the gas turbine engine requires intensive component, systems, and manufacturing process development by the auto industry. The current ERDA/Chrysler automotive gas turbine program indicates the earliest date for marketplace introduction of gas turbine cars is the 1986-87 time period. (Author)

**A77-48704** Improving automobile fuel economy with advanced transmissions. R. Kost and S. Luchter (U.S. Department of Transportation, Washington, D.C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 18-25. 6 refs.

The paper examines the fuel economy advantages of the continuously variable transmission over the conventional automatic transmission types and their projected improvements. A given engine is shown to operate more efficiently with a continuous automatic transmission than with conventional automatic transmission. The two most promising continuous automatic transmission candidates are the hydromechanical and traction-type transmissions. Some developmental work on these two concepts is briefly described.

P T H

**A77-48705** Continuously-variable transmission concepts suitable for flywheel hybrid automobiles. A. A. Frank, N. H. Beachley, R. W. Harter, A. P. Dietrich, and K. C. Lau (Wisconsin, University, Madison, Wis.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 26-33. 14 refs. U.S. Department of Transportation Grant No. OS-60177.

**A77-48706** Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine. L. H. Browning and R. K. Pefley (Santa Clara, University, Santa Clara, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 37-43. 14 refs. Research supported by the U.S. Environmental Protection Agency and ERDA.

A combustion kinetics computer model was used to study the compression ratio effects on performance and emissions of a methanol fueled spark ignition (SI) engine. Earlier experimental work by two independent research workers had shown that volumetric NOx emissions decreased when compression ratio was increased from 9.7:1 to 14:1 at MBT spark settings. The computer model, however, predicted a continual increase in volumetric NOx emissions for increasing compression ratio at MBT spark timing. With only a 3-deg retard from MBT, the computer-predicted volumetric NOx emission at 14:1 compression ratio was reduced to that at 8.44:1 compression ratio and MBT spark timing. With this spark retard setting, there was a net increase in power and thermal efficiency of 13.7% relative to the MBT values at 8.44:1 compression ratio. (Author)

**A77-48707** Cassava fuel alcohol in Brazil. V. Yang, W. N. Milfont, Jr., A. Scigliano, C. O. Massa, S. Sresnewsky, and S. C. Trindade (Centre de Tecnologia Promon, Rio de Janeiro, Brazil.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 44-53. 10 refs.

Energetics and economics of ethanol production from cassava under Brazilian conditions were analyzed. A 150 cu m/day alcohol distillery based on batch conversion and fermentation steps and employing a totally enzymatic process was the base distillery chosen. Comparison with alcohol production from sugar cane juice was made. Prospects for process energy improvements and effects on alcohol production costs are discussed and compared to base-distillery results. Net energy/ratio concept was used as basis for process energetics analysis. Sharp increase in cassava agriculture productivity is expected to considerably improve cassava fuel alcohol economics. (Author)

**A77-48708** Exhaust and evaporative emission from a Brazilian Chevrolet fueled with ethanol-gasoline blends. R. L. Furey and M. W. Jackson (General Motors Corp., Warren, Mich.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 54-61. 8 refs.

Exhaust and evaporative emissions from a 1974 Brazilian Chevrolet Opala were measured using gasoline and various ethanol-gasoline mixtures. For this car, which was designed to operate with rich air-fuel mixtures, addition of up to 20 percent ethanol to gasoline reduced exhaust hydrocarbon and carbon monoxide emissions, but increased exhaust aldehyde and nitrogen oxide emissions. The leaning of the air-fuel mixture, due to ethanol addition, was the primary cause of the exhaust emission changes. Evaporative emissions were slightly higher with 10 percent ethanol in gasoline, than with gasoline alone. (Author)

**A77-48709** Alternate fuels for future aircraft. G. D. Brewer (Lockheed-California Co., Burbank, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 62-68. 10 refs.

The paper mentions some results of comparisons of the applicability of liquid hydrogen-fueled aircraft of the future and equivalent aircraft fueled with Jet A. Liquid hydrogen-fueled aircraft show clear superiority stemming from better lift-to-drag ratio in cruise and the specific fuel consumption realized during cruise. These advantages are retained when supersonic transport aircraft are considered as well. At the moment, studies indicate that it would cost more to build and operate a hydrogen-fueled fleet than a fleet fueled with synthetic Jet A, but if one takes into account projected improvements in the production process for liquid hydrogen (hydrogen gasification) and for synthetic Jet A, the LH2-fueled aircraft comes out ahead. (Author)

P T H

**A77-48710** Utilizing methane from coalbeds. G. E. Voelker (ERDA, Washington, D.C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 78-82.

The paper discusses the possibility of recovering some of the estimated 240 trillion cubic feet of recoverable methane gas trapped in coal and surrounding rock strata in U.S. coal fields and which is currently being vented to the atmosphere during coal mining operations. The results of a study of the economic viability of various combinations of recovery and utilization options are presented indicating that the recovery and utilization of coalbed methane gas is practical and economically favorable in many instances. Near-term objectives of the ERDA program for coalbed methane conservation are selection and demonstration of promising systems and technologies for recovery, development of on-site systems for demonstration, and investigation of legal aspects of coalbed methane utilization. (Author)

P T H

**A77-48711** Synthetic carbonaceous fuels and feedstocks from oxides of carbon and nuclear power. M. Steinberg (Brookhaven National Laboratory, Upton, N.Y.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 89-93. 10 refs.

sion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 83-89 13 refs

Four sources of carbon oxides for conversion to synthetic fuels and feedstocks are considered the blast furnace, limestone calcination, coal-fired power plants, and a new system for fixation of atmospheric CO<sub>2</sub>. Methanol and gasoline can be produced from the top gas of an oxygen-blown blast furnace in combination with a nuclear-electrolytic system. Steam calcination of limestone using nuclear power would produce as a by-product synthetic carbonaceous fuels. Stack gas CO<sub>2</sub> can be converted to synthetic carbonaceous fuels by a nuclear-electrolytic process. For recovering CO<sub>2</sub> in the atmosphere, a process is proposed that depends on the electrolytic decomposition of water containing higher concentrations of carbonate/bicarbonate ion. P T H

**A77-48712 Solid fuels from biomass - Some environmental and economic considerations** C W Vail and J-F. Henry (InterTechnology/Solar Corp, Warrenton, Va) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 90-93 12 refs

A hypothetical woody biomass plantation with a given operating schedule was analyzed in terms of the universal soil loss equation in order to estimate the average amount of soil lost to erosion over an extended period of plantation operation. It is shown that such an energy plantation culture is less intense than traditional agriculture. Thus, lands classified as marginally fit for agriculture can be used to produce biomass crops on a renewable basis. The cost of producing fuel with the required conservation measures is estimated to be slightly more than \$1.20 per million Btu. P T H

**A77-48713 The prospects for fuels from biomass** E S. Lipinsky (Battelle Columbus Laboratories, Columbus, Ohio) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 94-99 9 refs ERDA-supported research

The prospects for making fuels from biomass are investigated by considering the process of converting sugarcane to ethanol and studying the economics of ethanol as a motor fuel. A cost analysis is made for a large ethanol distilling plant, and it is found that the cost of anhydrous ethanol would be about \$0.31 per liter. Adding anhydrous ethanol in a suitable gasoline blend would increase the selling price of gasoline \$0.015 to \$0.021 per liter. P T H

**A77-48714 \* Conceptual design of closed Brayton cycle for coal-fired power generation** R. P. Shah and J. C. Corman (General Electric Co, Schenectady, N Y) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 158-165 ERDA-NSF-sponsored research, Contract No. NAS3-19406

The objectives to be realized in developing a closed cycle gas turbine are (1) to exploit high temperature gas turbine technology while maintaining a working fluid which is free from combustion gas contamination, (2) to achieve compact turbo-equipment designs through pressurization of the working fluid, and (3) to obtain relatively simple cycle configurations. The technical/economic performance of a specific closed cycle gas turbine system was evaluated through the development of a conceptual plant and system design. This energy conversion system is designed for electric utility service and to utilize coal directly in an environmentally acceptable manner. (Author)

**A77-48716 Light commercial Brayton/Rankine space conditioning system** D. Friedman (AirResearch Manufacturing Company of California, Los Angeles, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-

September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 172-178

A heat-actuated space conditioning system that provides more efficient use of natural gas has been developed for 26.4- to 87.8-kW commercial applications. The system consists of a subatmospheric natural-gas-fired Brayton cycle engine that drives a Rankine cycle heat pump. A centrifugal freon compressor is driven directly from the Brayton engine rotating group through a permanent magnet coupling. Unique features that offer high life cycle performance include a hermetically sealed magnetic coupling, air foil bearings, an atmospheric in-line combustor, and a high temperature recuperator. Predicted overall engine efficiency is 27 percent and predicted overall coefficient of performance at the energy source is 0.85 in cooling and 1.0 in heating. (Author)

**A77-48717 Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant** R. C. Zentner and R. L. Shannon (Boeing Co, Engineering and Construction Div, Seattle, Wash) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 179-186 Research supported by the Electric Power Research Institute and Boeing Co

The paper describes a commercial central receiver solar power plant concept which utilizes Brayton cycle turbomachinery in an intermediate load power plant role. A one megawatt solar receiver, the Bench Model Solar Receiver, will be used to evaluate the central receiver design. Characteristics of this test model which are similar to those of the commercial unit include its heat exchanger operating temperatures, up to 870 C, insulation wall temperatures of about 1090 C, and thermal performance. Several aspects of the engineering and design of the receiver model are discussed, and theoretical design requirements for thermal similitude are considered. M L

**A77-48718 System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications** S. C. Kuo and T. L. O. Horton (United Technologies Research Center, East Hartford, Conn.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 187-193 9 refs Navy-supported research

A projection has been made for the typical specific weights which can be expected for naval ship propulsion systems utilizing large aircraft-derivative open-cycle engines in the early 1990's. The expected performance, size, and weight characteristics for these engines were identified and integrated with the expected future characteristics for the remaining conventional propulsion system components to estimate the total propulsion system specific weight. Several propulsion system arrangements were considered and the most promising were used to predict the payload/endurance relationship for the selected naval ship types considered. (Author)

**A77-48719 A ceramic heat exchanger for exhaust fired gas turbine power cycles** I. G. Most and K. G. Hagen (Hague International, South Portland, Me.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 194-199. 5 refs.

Until recently, combustion of solid fuels such as forest product residues, municipal waste, or coal in gas turbine power cycles has been limited by the corrosive action of the combustion products. A heat exchanger which can operate in this corrosive environment has been developed, making the exhaust fired gas turbine an economically viable power source. This heat exchanger is fabricated from a silicon carbide based ceramic and is a cross-counter flow shell and tube design. Use of this ceramic allows combustion product temperatures in excess of 1590 K. Operational and experimental experience has confirmed the heat exchanger performance characteristics and mechanical integrity under both thermal and physical abuse. This paper describes the design technique used in arriving at a

satisfactory heat exchanger for the exhaust fired cycle. A parametric analysis, based on heat exchanger inlet temperature, leads to a heat exchanger choice that yields the required effectiveness with minimum size and pressure drop. (Author)

**A77-48721 ERDA/P&WA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology.** J K Schweitzer and B T Brown (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 216-222

The objective of this program is to demonstrate the utilization of advanced aircraft turbine cooling and high pressure compressor technology to achieve high performance, improved durability, and low initial cost in a 15,000 shp/10Mw class industrial gas turbine. Conceptual engine optimization studies and the detailed analytical and mechanical design of the compressor and turbine critical-component test rigs have been completed. Component validation testing and a gas generator demonstrator test are planned in subsequent phases. The advanced single-spool compressor employs low aspect ratio axial compressor blading and a centrifugal back end stage to achieve 18:1 pressure ratio at 90% polytropic efficiency in only seven stages. An innovative turbine air cooling approach in which the airfoils are fabricated from a series of bonded wafers with intricate convective cooling passages is utilized to attain a 20,000 hour life at a combustor exit temperature of 1371 C (2500 F). Predicted specific fuel consumption at ISO conditions is 0.23 kg/hr/kw (0.38 lb/hr/hp). Future development of thermal barrier coatings may permit a further increase in combustor exit temperature to approximately 1593 C (2900 F). (Author)

**A77-48722 Development of the Westinghouse coal gasification process - A status report.** L A Salvador, J D Holmgren, L K Rath, and P J Margaritis (Westinghouse Research and Development Center, Waltz Mill, Pa.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 224-231 ERDA-sponsored research

The paper describes the development of a fluidized-bed low-Btu coal gasification process for use in combined-cycle electric power generation. Devolatilization and gasification are the two main steps in the process. In the devolatilizer, unpretreated coal is fed to a recirculating fluidized bed operating at 1150 kPa (225 psig) and 870 C (1600 F) in which it is cracked and devolatilized to produce a char product and a product gas. The char is fed to the gasifier where it is combusted with air and gasified with steam to produce a dry granular agglomerated ash product. Process development activities are carried out in a 14,000 kg/d (15 t/d) process development unit (PDU). Feasibility of the devolatilizer reactor was demonstrated using a variety of coals. The gasifier reactor feasibility demonstration is in progress, the unit has produced agglomerated ash. (Author)

**A77-48723 Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite.** J F Branch, P S Schmidt, and T F Edgar (Texas University, Austin, Tex.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 232-238 10 refs

This paper analyzes the utilization of low-BTU gas from in-situ combustion of lignite in gas turbines and combined cycles. Several gas compositions are considered, corresponding to various lignite conversion conditions. The analysis takes into account the work requirements for turbine blade cooling, gasification air, and fuel gas compression, as well as air compression for the gas turbine itself. It is demonstrated that overall cycle efficiency tends to degrade somewhat as fuel heating value decreases, primarily because of the higher work requirements to compress the fuel. At optimum efficiency, the gas turbine carries a larger share of the overall load compared to the

steam turbine for the low BTU gas versus natural gas. It is also shown that the gain in efficiency by increasing firing temperature from 2400 to 3000 F is largely offset by the air requirements for turbine blade cooling. (Author)

**A77-48724 Coal gasification combined-cycle pilot plant system analysis.** T T Kao, S M Cho, R A McCallister (Foster Wheeler Energy Corp., Livingston, N.J.), and R S. Kane (Foster Wheeler Energy Corp., Livingston, N.J., Manhattan College, Manhattan, N.Y.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 239-247. 8 refs. Research supported by the Foster Wheeler Energy Corp., Grant No. FE-14-32-001-1521

A detailed computer model has been developed for the system simulation of an integrated coal gasification combined-cycle pilot plant using an air-blown, two-stage, entrained flow, slagging gasifier. The pilot plant system is described by a system of partial differential and algebraic equations governing the energy, material and momentum balance of the pilot plant. Both steady-state and transient studies have been carried out with a computer code in order to investigate the pilot plant performance characteristics, as well as component interface under various operating conditions. The results indicate that the integrated coal gasification combined-cycle pilot plant can perform satisfactorily in all cases studied. (Author)

**A77-48725 The zinc-bromine battery - Possible candidate for electric vehicles and load leveling.** F G Will (General Electric Co., Schenectady, N.Y.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 250-255 7 refs. ERDA-sponsored research.

The zinc-bromine battery is a fundamentally attractive candidate for electric vehicles and load leveling owing to the use of abundant low-cost materials, its high energy density, good efficiency, and ambient temperature operation. An approach to zinc-bromine batteries is described which avoids the traditional shortcomings of rapid self-discharge and short cycle life. The major features of the approach are the use of an ion exchange membrane, optimized electrolyte composition, and electrolyte circulation. The rate of self-discharge has been decreased to 0.1% per hour, and a cycle life of at least two thousand 2.5-hour cycles at 25 ma/sq cm has been demonstrated. (Author)

**A77-48726 The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery.** W E Miller, V. M. Kolba, A A Chilenskas (Argonne National Laboratory, Argonne, Ill.), and K Gentry (Argonne National Laboratory, Argonne, Ill., Eagle-Picher Industries, Inc., Joplin, Mo.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 256-261. 5 refs. ERDA-sponsored research

**A77-48727 Design of a current technology electric vehicle.** R H Guess, W R Nial (General Electric Co., Schenectady, N.Y.), and M A Pocobello (Triad Services, Inc., Dearborn, Mich.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings, Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 262-268

The design characteristics of a four passenger electric vehicle intended for urban use are described, and the energy consumption at various steady state level vehicle speeds is portrayed. Several design components and structural features of the vehicle are discussed. Topics include the battery, battery packaging, battery charger, the propulsion subsystem, and the power conditioning unit. Structural features considered include the seating arrangement, passenger doors, front and rear suspension, and the brakes. Upgrading technology is

identified by trade-off analysis, and predicted improvements are listed. M L

**A77-48728 Flywheel module for electric vehicle regenerative braking** E L Lustenader, E Richter, F G Turnbull, J S Hickey (General Electric Co., Schenectady, N.Y.), and G Chang (ERDA, Div of Energy Storage Systems, Washington, D C) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 269-274. 9 refs

Current battery electric vehicles are limited in multi-stop-and-go driving range and accelerating capability by the lead-acid battery which cannot handle high power peaks and still maintain high energy density. A hybrid flywheel/battery system can isolate the battery from the accelerating power peaks and also recover a substantial portion of the available braking energy. This paper describes the development of a small, high speed, lightweight flywheel/a-c synchronous motor alternator sealed energy storage package coupled to a load commutated inverter power circuit. The system stores sufficient energy in the rotor of the machine for one stop-start cycle. A composite flywheel is used to store additional energy for several cycles, or enough for climbing or descending short grades. (Author)

**A77-48729 Rechargeability studies of ambient temperature lithium/sulfur batteries.** R D Rauh, G F. Pearson, and S B. Brummer (EIC Corp., Newton, Mass.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 283-287. 22 refs. Grant No. EY-76-C-02-2520.

An ambient temperature Li/S battery of the configuration Li/Li<sub>2</sub>S(n) organic solvent/C is described, where the cathode material is totally soluble in the electrolyte. For a practical battery, the sulfur concentration must be greater than 5M. Despite the intimate contact between the Li anode and the cathode, the cell can be charged. Prototype cells have been cycled at 25 C and at 50 C. Charge and discharge rates ranged from 0.5-2.0 mA/sq cm. At least 120 low capacity cycles (0.10e(-)/S) have been demonstrated at 50 C, with an average efficiency of 95%. For a cycle depth of 0.5e(-)/S, efficiencies at 1 mA/sq cm are 95% at 25 C and 90% at 50 C. The anode cycling efficiency is, within experimental error, the same as that of the total cell. Therefore, any Li dendrites isolated on the anode during cycling are dissolved via the self-discharge reaction. This maintains the materials balance in the cell, a major requirement for its practical success. (Author)

**A77-48730 The storability of Li/SO<sub>2</sub> cells.** H. Taylor (P R. Mallory and Co., Inc., Burlington, Mass.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 288-295. 16 refs.

Li/SO<sub>2</sub> cells have been stored for as long as five years at ambient temperatures. Particularly when they are of hermetic construction, they appear to have very good storability, not only in the inactive state, but also under continuous low-rate discharge even at elevated temperatures. Voltage start-up at low temperatures after storage extremes is minimal. Li/SO<sub>2</sub> D-cells deliver 9 Wh/cu in and 147 Wh/lb at -23 C under a 1 mA continuous drain rate. (Author)

**A77-48734 ERDA fuel cell programs.** L R. Lawrence, Jr (ERDA, Washington, D.C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 319-324.

Fuel cell technology and goals are discussed. A first generation 4.8 MW fuel cell power system is being planned for the purpose of demonstrating the concept viability of a large-scale fuel cell generator. This first generation system will have the capability of operating with a variety of gaseous and liquid fuels, and will be

placed in an electric utility power grid in mid-1978. The system will also be used to supersede gas-fired furnaces for space heating. A study comparing a gas-fired furnace to a fuel cell/heat pump combination, utilizing waste heat, shows a natural gas savings of 40%. It is thought that fuel cell technology can save at least 275,000 barrels of oil per day by 1985. Second generation fuel cells, which use molten carbonate, are being planned for installation in the mid-1980's. M L

**A77-48735 Advanced fuel cell technology and applications.** J. M. King, W E Houghtby, and R A Sederquist (United Technology Corp., Power Systems Div., South Windsor, Conn.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 325-329. 5 refs.

The Advanced Technology Fuel Cell Program objective, is to establish the technology and design base for fuel cell powerplants with reduced capital cost, a 7500 BTU/kWh heat rate and fuel capability extending to Number 2 fuel oil. Molten carbonate, advanced phosphoric acid fuel cells, and advanced fuel processing concepts are being investigated and approaches to the use of coal with fuel cell powerplants are under evaluation. A low cost concept was demonstrated in a 20-cell phosphoric acid stack. Subscale molten carbonate cell performance and endurance have improved significantly. A 19-cell stack test confirmed the ability to scale molten carbonate cells. An advanced reforming laboratory rig operated stably for 1000 hours on No. 2 fuel oil with 2500 ppm sulfur. Coal-fueled concepts have been investigated for central stations. Studies indicate coal pile-to-bus bar efficiencies of 45-50% can be achieved. (Author)

**A77-48736 ERDA Fuel Cell Applied Research Program.** I L Harry (ERDA, Washington, D C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 330-336.

A program demonstrating the technical feasibility of a high-temperature, solid-electrolyte fuel cell is described. A typical cell uses nickel or cobalt-zirconia cermets as fuel-electrode materials, with tin-doped indium oxide the preferred air electrode material and either calcia- or yttria-stabilized zirconia as the electrolyte film. Fuel cell technology involving electrocatalysis and such advanced concepts as alternate acid electrolytes is also considered, and direct coal-air fuel cell are discussed. B J

**A77-48737 Molten carbonate fuel cell model.** D J Dharja (Energy Research Corp., Danbury, Conn.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 337-340. Contract No. E(04-3)-1196.

A mathematical model describing the behavior of the molten carbonate fuel cell is presented. The model computes the values for dimensionless local and average current densities and fuel and oxidant conversions as a function of dimensionless fuel cell length for given cathode and anode gas compositions, temperature, ratio of fuel to oxidant flow and terminal voltage of the fuel cell. The experimental polarization curves were compared with the polarization curves generated by the model. Agreement between experiment and theory are discussed and the limits of model applications described. (Author)

**A77-48738 4.8-megawatt fuel cell module demonstrator.** L M Handley (United Technologies Corp., Power Systems Div., South Windsor, Conn.), L J Rogers (ERDA, Washington, D C.), and E Gillis (Electric Power Research Institute, Palo Alto, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 341-348. 6 refs. Grant No. EX-76-C-01-2102.

A 4.8 MW fuel cell demonstrator powerplant is being constructed by United Technologies with support from ERDA and EPRI, to be erected and tested at a utility site starting in late 1978. The dc module is the heart of the demonstrator; its purpose is to convert hydrocarbon fuel and air into direct current. The power conditioner converts dc power from the dc module to three-phase, 60-Hz ac power at 13.8 kV. The demonstrator is controlled from a site control center, while each of the modular units includes its own controller. B J

**A77-48739** Post-test analysis of Li/FeS<sub>2</sub> compact cells. R A Murie (GM Research Laboratories, Warren, Mich.) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 349-358.

The Li/FeS<sub>2</sub> cell utilizing a molten salt electrolyte is being actively studied as a candidate for electric vehicle power. The post-test analysis of cells that have operated for thousands of hours supplies fundamental data on materials, corrosion, mass transfer of positive and negative electrode materials, separator effectiveness, electrode behavior and design. This paper discusses the results obtained from the post-test analysis of two compact Li/FeS<sub>2</sub> cells, CC-1 and CC-2, that operated for 10,462 and 1,733 h, respectively, primarily at 475 C. The testing of CC-1 was terminated due to shorting and loss in efficiency. The second cell, CC-2, was terminated after the failure of an external cycling system permitted an extended overdischarge to occur. (Author)

**A77-48740** Recent progress in development of sodium-sulfur battery for utility application. S. P. Mitoff, M. W. Breiter, and D. Chatterji (General Electric Co., Schenectady, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 359-367. 8 refs. Research supported by the Electric Power Research Institute.

The development of a sodium-sulfur battery system for utility applications is outlined. Experience gained with small, 16 Ah capacity test cells is discussed with particular emphasis on life and performance improvements made in recent years. Cells now operate with 80% or greater capacity utilization. The average cell efficiency is about 75%. The life of these 'metal' test cells has now increased to 12,000 test hours at 54 mA/sq cm current density and 9960 test hours at 108 mA/sq cm. These life and performance improvements are compared against the long-range goals and areas for further technological and/or cost improvements are identified. The basic features of alternative preliminary designs for the BEST battery are described to illustrate the type of design-manufacturability - cost - reliability iterations needed before arriving at the final decision. (Author)

**A77-48741** Development status of lithium-silicon/iron sulfide load leveling batteries. S. Sudar, L. A. Heredy, J. C. Hall, and L. R. McCoy (Rockwell International Corp., Atomics International Div., Canoga Park, Calif.). In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 368-374. 9 refs. Research supported by the Argonne National Laboratory and Electric Power Research Institute.

High-temperature, molten salt batteries using lithium-silicon negative electrodes and iron sulfide positive electrodes are being developed for electric utility load-leveling use. Corrosion-resistant FeS positive electrode structures have been developed which resist deformation in use. Performance improvements in negative electrodes have been achieved with modifications of the lithium-silicon alloy. These electrodes have been incorporated into compact cells and an energy density of 79 Wh/kg has been reached. The use of powdered ceramic separators has resulted in improved cell performance and reliability. A 150-W.h cell has been operated for over 1100 cycles in a period of more than 1 year. Scaleup of these cells

has been carried out without difficulty to that of a multi-electrode cell with a capacity of 1 kWh. The present development status of these batteries is described. (Author)

**A77-48742** Improved negative electrodes for lithium/iron sulfide batteries. S.-C. Lai and A. F. Sammells (Rockwell International Corp., Atomics International Div., Canoga Park, Calif.). In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 375-379. 7 refs.

A program for the development of lithium-silicon alloy negative electrodes for lithium/iron sulfide load-leveling batteries is being carried out. These batteries use a molten LiCl-KCl electrolyte and are operated at temperatures at 400 to 450 C. Negative electrodes have been fabricated in both the initially charged and discharged states. An additive with silicon has been found which permits these electrodes to be built in the discharged state and subsequently charged with high active material utilization. The electrochemical properties of electrodes using the modified alloy are superior to those obtained with negative electrodes using the lithium-silicon alloy alone. A problem with silicon transfer to the electrode support structure has been identified. Metal silicides formed as a result of this transfer are brittle and electrode capacity declines if lithium silicon electrodes are cycled at high (550 C) temperatures. This problem has been alleviated by further alloy modification. Metals have also been found which resist silicon attack. (Author)

**A77-48743** Energy and economic effects of residential energy conservation programs. E. Hirst and J. Carney (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 383-389. 14 refs. Research supported by the Federal Energy Administration and ERDA.

A detailed simulation model of residential energy consumption is used to evaluate the energy and direct economic effects of several conservation programs: appliance efficiency targets, thermal standards for new construction, and retrofit of existing housing units. Results suggest that each of these programs saves energy and saves money. For example, these programs could cut energy use in the year 2000 by 15-25% and save households \$25-\$45 billion between now and 2000. (Author)

**A77-48744** Development of the High Seasonal Performance Factor Gas Heat Pump. P. F. Swenson (Consolidated Natural Gas Co., Inc., Cleveland, Ohio) and R. K. Rose (Mechanical Technology, Inc., Ballston Spa, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 390-396.

A program aimed at the development of a high seasonal performance factor gas energized heat pump for space heating has been undertaken by Consolidated Gas and ERDA. The main feature of the HSPF (High Seasonal Performance Factor) Gas Heat Pump is a single shaft gas bearing turbomachine which uses a steam-Rankine prime mover. The auxiliaries are self-propelled, and phased heat exchange is utilized on the indoor and outdoor cores. The unit is modulated in accordance with ambient temperature and the hardware is packaged in conventional rooftop configuration. Program and system descriptions are given and attention is paid to a component design and performance and a system performance prediction. B.J.

**A77-48745** Development of a Stirling engine powered heat activated heat pump. W. L. Auxer (General Electric Co., Space Div., King of Prussia, Pa.). In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 397-401.

A 3-ton heat activated heat pump, employing a natural gasified Stirling engine to drive the vapor compressor is being developed. This Stirling engine/Rankine cycle refrigeration loop concept would consume about one-half the gas required by conventional space heating equipment, and offers an efficient and competitive means of providing summer cooling, thus tending to equalize the summer-winter gas loads. A functional description (with functional diagram and component definition) of the heat pump is given and system performance is predicted (Author)

**A77-48748** Free-piston heat pumps G. M. Benson (ERG, Inc., Oakland, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 416-425 18 refs.

This paper summarizes ERG's work on free-piston thermal-engine-driven heat pumps which operate on the following engine/heat pump cycles: Otto/Rankine, Diesel/Rankine, Brayton/Rankine, Rankine/Rankine, Stirling/Stirling, Stirling/Rankine and Ericsson/Ericsson. Of these machines the Stirling/Rankine and Ericsson/Ericsson offer the most potential. The Ericsson/Ericsson machine is preferred, owing to its self-modulating capacity that is independent of evaporator and condenser temperatures and its high COP that exceeds vapor-compression heat pumps. These features, together with its ability to co-generate electricity, through use of an integral linear alternator, and its potential to use solar or fossil fuel (including coal), offer promise for substantial energy conservation (Author)

**A77-48750** Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy. S. M. Ko and D. V. Merrifield (Lockheed Missiles and Space Co., Inc., Huntsville, Ala.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 434-441 14 refs. Contract No. E(40-1)-5157

The regenerated desiccant crop drying concept is technically feasible and is capable of achieving a drying efficiency of approximately twice that of conventional crop drying systems. When using a fossil fuel energy source, energy savings will be approximately 40 to 50%. With solar energy input, the total fossil fuel savings can be 70 to 90%. As with other new energy conserving systems that are presently capital-intensive, the economic viability of the system will be dependent on future capital cost reductions, on the future price of fossil fuels, and on the specific application of the system. Regarding agricultural applications, it was concluded that the regenerated desiccant drying system, with or without the use of solar energy, will be economically best suited for a large central processing application, where it can receive a maximum amount of use and will benefit from economy-of-scale cost considerations (Author)

**A77-48751** Feasibility study of an Integrated Energy/Utility System at the University of Florida. E. F. Cox (Applied Energy Sciences, Inc., Atlanta, Ga.), D. W. Kirmse (Florida University, Gainesville, Fla.), and S. B. Manyimo (Reynolds, Smith and Hills, Jacksonville, Fla.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 442-448 NBS-sponsored research

An Integrated Energy/Utility System (IUS) provides conservation of fuel and water by the integration of utility systems which serve the community. Complete integration in an IUS is achieved by the addition to onsite power generation of solid waste incineration with heat recovery, water supply treatment, and sewage treatment. Treated effluent may also be used for several purposes such as cooling tower makeup, plant makeup, and irrigation. The technical feasibility and economic benefits of an IUS at the University of Florida were analyzed along with environmental and institutional factors. The results of this study project a savings in purchased energy of 44% or \$4,000,000 annually. B. J.

**A77-48752** Energy savings through on-site fuel cells in industrial applications. G. E. Voelker (ERDA, Fuel Cell Branch, Washington, D.C.) and P. Bolan (United Technologies Corp., Power Systems Div., Farmington, Conn.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 456-460

Cogeneration with electric generating equipment located at or near the load rather than centrally sited can provide important means of conserving energy resources. The energy savings which could be achieved in certain industrial applications by use of on-site fuel cell powerplants have been examined. Twelve industrial processes were selected for study. A fuel cell system was specified for each of the twelve selected industrial processes and energy resource consumption was determined in each case. Eleven of the twelve applications used recovered heat as well as the electricity produced by the fuel cell. In six cases, process by-product fuel was used and in four processes direct current electricity was provided. When compared with traditional energy resource consumption in each process, significant potential savings were found in all cases. In five of the processes studied, savings exceeded 20%. Overall, for the twelve processes investigated, extensive use of on-site fuel cell systems could result in resource savings of 190,000 barrels of oil (equivalent) per day (Author)

**A77-48753** The photosynthesis energy factory - Analysis, synthesis, and demonstration. G. C. Szego, M. D. Fraser, C. H. Harmer, J. F. Henry, W. B. Scholten, C. W. Vail (InterTechnology/Solar Corp., Warrenton, Va.), W. J. Oswald, and J. R. Benemann (California University, Berkeley, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 461-468 9 refs. Contract No. E(49-18)-2548

The Photosynthesis Energy Factory is a synergistic combination of the dry land Energy Plantation and an algae production system which can produce, on a perpetually renewable basis, unpolluting and totally domestic fuels from solar energy and various residues. From the Energy Plantation, woody plant matter is produced which is chipped and used as a solid fuel in a power plant to produce electricity. The algae production system uses the nutrients in wastewater and the CO<sub>2</sub> in power plant flue gas to produce algae, which are harvested and ultimately digested anaerobically to produce methane. Digester sludge is disposed of in a beneficial way by being put onto the Energy Plantation. A comprehensive techno-economic model is being developed for a systems analysis. Potential sites for a demonstration project are being analyzed and selected. The final task in this project is to develop a preliminary design and associated cost estimates for a proposed demonstration (Author)

**A77-48755** Biphasic turbines for diesel bottoming. L. Hays (Biphasic Engines, Inc., Santa Monica, Calif.) and J. Neal (ERDA, Washington, D C) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 473-481. 9 refs.

Application of a two-phase turbine system to waste heat recovery was examined. Bottoming cycle efficiencies ranging from 15-30% were calculated for a 720 F diesel exhaust temperature. A single stage demonstration unit, designed for nontoxic fluids (water and Dowtherm A) and for atmospheric seals and bearings, had a cycle efficiency of 23%. The net output power was 276 HP at 8000 rpm, increasing the total shaft power from 1800 HP for the diesel alone, to 2076 HP for the combined system. A four stage organic turbine, for the same application, had a rotational speed of 14,700 rpm while a four stage steam turbine had 26,000 rpm. An additional reduction in capital cost was found to result from the use of a contact heat exchanger instead of tube-fin construction. The cost of a contact heat exchanger was only \$35-52/kWe compared to \$98/kWe for a tube-fin heat exchanger. The major improvement leading to higher cycle efficiency and lower turbine rpm was found to be the use of a liquid component with lower sensible heat (Author)

**A77-48756** Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications. I Borde, I Yaron, and M Jelinek (Negev, University, Beersheba, Israel). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 482-488 5 refs

Low thermal-potential energy sources, e.g., waste heat, solar energy, etc., can be utilized for refrigeration or cooling in various industrial applications. Suitable working solutions have been selected to operate in an absorption refrigeration cycle. A computer program delineated the ranges of feasible operating parameters and chose the optimal operating conditions for given energy sources, refrigeration requirements and ambient conditions. The effects of various parameters upon the coefficient of performance and the circulation ratio of the system were investigated. With Freon 22 as refrigerant, the feasibility has been demonstrated of obtaining efficient cooling by direct-contact evaporation. Specific fields of application are indicated (Author)

**A77-48758** Heat pipes for hostile environments in energy conservation applications. A Basulis and G I. Ewell (Hughes Aircraft Co., Torrance, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 493-497

Heat pipes offer many advantages for potential use in energy recovery applications: unrestricted form factor, large choice of materials and material combinations, and each heat pipe can operate independently or in concert with other heat pipes in the heat recovery unit. A program was initiated to develop heat pipes for hostile environments such as sulfur plants and coal gasifiers. Heat pipe materials and potential coatings were evaluated for corrosive and abrasive environments from 200 C to 600 C. This study indicated that heat pipes can be designed and built for heat recovery, but compatibility data in the environment was lacking, and that field test data is badly needed. A heat pipe test vehicle for data acquisition was designed, fabricated, and bench model tests have been completed. A test vehicle is ready for field tests in sulfur plants and coal gasifiers (Author)

**A77-48759** Exact 60 cycle power generation at any speed. R T Morash (Precise Power Corp., Bradenton, Fla.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 498-504 10 refs

A new electrical power generator produces any exact frequency, at any shaft rpm. The speed can vary over a wide range without affecting the output frequency or voltage. This capability has been developed on operating units for precise frequency converters and flywheel energy storage units in uninterruptible power systems. Other useful applications are: 60 cycle power directly from a varying speed windmill shaft, auxiliary power take-off from a mobile unit, variable speed prime mover, up-rating diesel-generator sets by allowing the diesel to run at optimum design speeds, energy conservation in on-site or small power systems by using variable speed to match load requirement, precise power for portable or remote locations such as geodetic survey work or video applications, unusual frequency requirements, and simple parallel operation of numerous generators producing identical frequency. A typical unit is described. Units from Kilowatt to Megawatt sizes can be built. (Author)

**A77-48760** The design of a sodium sulfate decahydrate heat exchanger for coolness storage. S Kumar and F A Costello (InterTechnology Solar Corp., Warrenton, Va.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 511-516

The use of a mixture of salts for coolness storage is analyzed with attention to the effects of different salt mixture and heat

exchange configurations. The enthalpy-temperature relationship of the mixture was obtained experimentally, and this relationship was used to solve the differential equations characterizing the performance of the salt under dynamic conditions. The differential equations are solved for several heat exchanger geometries of practical interest. Solutions to the differential equations are combined so the overall performance of the heat-storage heat exchanger can be estimated. The resulting equations are useful in predicting the temperature history of air exiting from the heat exchanger as a function of time and as a function of the inlet conditions to the heat exchanger. M.L.

**A77-48761** Energy storage - An interference assembled multiring superflywheel. J A Kirk and R A Huntington (Maryland, University, College Park, Md.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 517-524. 23 refs

A stress analysis and energy density maximization procedure has been developed for improving the performance of multiring composite material flywheels. The procedure utilizes interference assembly between individual flywheel rings and causes a redistribution of centrifugal stresses. An example of a multiring magnetically suspended flywheel is considered and significant gains in rotor performance are shown to be possible (Author)

**A77-48762** Conversion and storage of wind energy as nitrogenous fertilizer. M Dubey (Lockheed-California Co., Burbank, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 525-532 6 refs NSF Grant No C-75-22186

The use of wind energy, air, and water to produce ammonia for use as a nitrogenous fertilizer is discussed. A study shows that it is technologically feasible to reduce the scale of an ammonia processing plant to produce a tiny fraction of the output rates of full scale commercial plants. Such a system can be adequately powered by a wind turbine driving an electrolysis cell to produce the required hydrogen feedstock. The process is described, and several factors, such as energy storage, product storage, and energy balance and component matching, are considered. The economics of the system are analyzed, and it is thought that the cost of the produced fertilizer will be competitive if natural gas prices continue to rise. M L

**A77-48763 \*** ERDA's Chemical Energy Storage Program. J H Swisher (ERDA, Div of Energy Storage Systems, Washington, D C) and J H Kelley (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 533-539 10 refs

The Chemical Energy Storage Program is described with emphasis on hydrogen storage. Storage techniques considered include pressurized hydrogen gas storage, cryogenic liquid hydrogen storage, storage in hydride compounds, and aromatic-alicyclic hydrogen storage. Some uses of energy storage are suggested. Information on hydrogen production and hydrogen use is also presented. Applications of hydrogen energy systems include storage of hydrogen for utilities load leveling, industrial marketing of hydrogen both as a chemical and as a fuel, natural gas supplementation, vehicular applications, and direct substitution for natural gas. M L

**A77-48764** High temperature thermal energy storage system, Na<sub>2</sub>SO<sub>4</sub> + SO<sub>3</sub> reversibly yields Na<sub>2</sub>S<sub>2</sub>O<sub>7</sub>. R S Hockett and R W Serth (Monsanto Research Corp., Dayton, Ohio) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 540-546 7 refs



A preliminary process design is presented for a thermal energy storage system based on the reversible thermal decomposition of sodium pyrosulfate. A thermodynamic analysis of the system operating in conjunction with a conventional Rankine steam power cycle is presented, and the materials and volume requirements of the storage system are determined. A number of fundamental problems which must be resolved in order to demonstrate the technical feasibility of the concept are identified and discussed. (Author)

**A77-48765 \*** Molten salt thermal energy storage for utility peaking loads. A Ferrara, R Haslett (Grumman Aerospace Corp., Bethpage, N.Y.), and J Joyce (NASA, Lewis Research Center, Cleveland, Ohio). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 547-554. 6 refs.

This paper considers the use of thermal energy storage (TES) in molten salts to increase the capacity of power plants. Five existing fossil and nuclear electric utility plants were selected as representative of current technology. A review of system load diagrams indicated that TES to meet loads over 95% of peak was a reasonable goal. Alternate TES heat exchanger locations were evaluated, showing that the stored energy should be used either for feedwater heating or to generate steam for an auxiliary power cycle. Specific salts for each concept are recommended. Design layouts were prepared for one plant, and it was shown that a TES tube/shell heat exchanger system could provide about 7% peaking capability at lower cost than adding steam generation capacity. Promising alternate heat exchanger concepts were also identified. (Author)

**A77-48767** Investigation of metal fluoride thermal energy storage materials. J. L. Eichelberger and H. D. Gillman (Pennwalt Corp., King of Prussia, Pa.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 567-574. 16 refs. Grant No. EY-76-C-02-2990.

Storage of thermal energy in the 400-1000 C range is attracting increasing consideration for use in solar power, central power, vehicular and commercial process systems. This study investigates the practicality of using metal fluorides as the heat storage media. The projected availability of metal fluorides has been studied and is shown to be adequate for wide-spread thermal storage use. Costs are projected and discussed in relation to thermal energy storage applications. Phase diagrams, heats of fusion, heat capacities, vapor pressures, toxicity, stability, volume changes, thermal conductivities, fusion kinetics, corrosion, and container materials of construction for a wide range of fluorides have been examined. Analyses of these data in consideration of thermal energy storage requirements have resulted in selection of the most cost-effective fluoride or fluoride mixture for each of 23 temperature increments between 400 and 1000 C. Thermophysical properties of these 23 materials are presented. (Author)

**A77-48768** Safety considerations for high temperature thermal energy storage in fluoride salts. O. Boser (North American Philips Laboratories, Briarcliff Manor, N.Y.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 575-582. 12 refs.

The safety aspects of thermal energy storage at high temperatures in fluoride mixtures were studied. An experimental thermal energy storage unit is described, and the prevention of corrosion of the stainless steel container by doping the fluorides with aluminum is discussed. Experiments that illustrate the fire hazard of molten fluorides are described. No chemical reactions with various materials, including materials to extinguish fires, were observed. The fluoride mixture was found to dissolve in water at a rate of 2.6 g per 100 ml of water which is less than the 4 g per 100 ml of water of pure NaF. In addition, specimens were ruptured to simulate the situation in the case of residential home heating and automotive propulsion. In the

first case only fluorides were used. In the second case fluorides and sodium were combined, the latter simulating the heat pipe. It was found that sodium has to be contained safely, whereas the fluorides are very stable and do not react with insulation material. (Author)

**A77-48769** Large-scale thermal storage in rock - Construction, utilization, and economics. M. P. Hardy, V. D. Albertson, T. P. Bligh, M. Riaz, and P. L. Blackshear (Minnesota, University, Minneapolis, Minn.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 583-590. 15 refs. Grant No. EY-76-S-02-4002.

The performance, design constraints, construction methods, and economics of a large-scale rock bed heat accumulator capable of providing 300 MWt at high temperatures (250 to 500 C) for up to 6 months are discussed. Six construction schemes are identified and compared in relation to siting requirements, land use, ground water interaction, rock quality, and construction cost. Examples are given of the effect of construction cost, construction period and plant life on the present worth of stored energy. For the assumed operating conditions this present worth of stored energy is less than 15 mills/kWh, thus making the concept of a rock bed accumulator economically attractive for long-term storage. (Author)

**A77-48770** Conceptual design of underground compressed air storage electric power systems. A. J. Gramont, R. D. Lessard (United Technologies Research Center, East Hartford, Conn.), and M. J. Hobson (Acres American, Inc., Buffalo, N.Y.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 591-598. 13 refs.

Conceptual design studies have been conducted to identify Compressed Air Energy Storage (CAES) systems which are potentially attractive for future electric utility load-leveling applications. The CAES concept consists of compressing air during off-peak periods, underground storage, followed by heating and expansion through turbines to generate power. By using off-peak electricity for compression and stored air for peak load generation, the resulting oil consumption would be about 40 percent of that consumed by conventional peaking plants. Equipment requirements could be met using existing turbomachinery with relatively modest modifications. The present study focused on air storage in hydraulically compensated hard-rock caverns. Conventional underground excavation technology could be used to construct these caverns, and sufficient siting opportunities exist in the North Central and Northeast regions of the US. (Author)

**A77 48771** Improved systems for energy conversion and conservation as pollution control alternatives - USEPA program. H. E. Bostian, H. S. Skovronek, and R. E. Mournighan (US Environmental Protection Agency, Industrial Environmental Research Laboratory, Cincinnati, Ohio). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 600-606. 7 refs.

This paper is an overview of a USEPA research program on energy conversion and conservation. The program emphasis is on environmental problems or benefits of more efficient energy systems or ones using more abundant domestic energy resources. More efficient energy systems can generally be considered as environmentally attractive alternatives but their relative environmental-economic benefits need to be determined. On the other hand, some systems could have unique pollution control problems because of different operating conditions, use of higher sulfur fuels and feedstocks, or possible generation of hazardous pollutants. The program coverage includes the environmental aspects of waste energy utilization and other energy conservation measures, advanced power systems such as magnetohydrodynamics, ones using high temperature turbines, and solar and geothermal energy conversion. (Author)



**A77-48772**      **Pollution control in geothermal energy.** R. P. Hartley (U S Environmental Protection Agency, Industrial Environmental Research Laboratory, Cincinnati, Ohio) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 607-613, 11 refs.

Pollution problems will occur in geothermal energy development because large volumes of spent geothermal fluid will be released, potentially contaminating the air, surface waters, and ground waters. Waters may be highly saline and contain metals in hazardous concentrations. Noncondensable gases are of greatest concern in air discharges. The principal anticipated liquid disposal method is reinjection to the producing reservoir, for which reliable technologies must be developed. Water treatment for surface discharge could be possible but costly, although minerals recovery might be off-setting in some cases. The principal air pollutant of concern is hydrogen sulfide although such constituents as ammonia, radon, and mercury may also be significant. Considerable development and demonstration is under way for hydrogen sulfide removal. Resource characterization data are not yet sufficient to predict the full range of potential pollution problems, particularly for the widespread and variable liquid-dominated resource. (Author)

**A77-48773**      **Environmental impact of major solar power development.** D. R. Sears, M. G. Gandel (Lockheed Missiles and Space Co., Huntsville, Ala.), R. P. Hartley (U S Environmental Protection Agency, Cincinnati, Ohio), and W. G. Bradley (Environmental Consultants, Inc., Las Vegas, Nev.) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 614-620, 15 refs. U.S. Environmental Protection Agency Contract No. 68-02-1331

We have examined the environmental effects of terrestrial silicon photovoltaic power generation in utility application, by following the chain of events from raw material extraction to plant operation. CdS and GaAs technology, satellite siting, and solar steam-electric plants are also discussed briefly. (Author)

**A77-48775**      **Impact of air quality regulation on the electric power industry.** K. Yeager (Electric Power Research Institute, Palo Alto, Calif.) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 637-645

The paper will consider several emerging trends in air pollution regulations and legal interpretations of the Clean Air Act which have major impact on the electric utility industry. Foremost among these trends is the shift from health and welfare based ambient air quality regulations to an administration definition of 'Best Available Control Technology' (BACT) as the primary mechanism for air quality change. The paper will specifically analyze BACT in terms of the technologies required in the time frame of 1977-1990, together with their costs and operating implications for the electric utility industry. Since the BACT concept forms the basis for several regulatory applications to the electric utility industry, its technological and economic implications will be analyzed in terms of a strategy which is not only the least costly but the only one consistent with available supplies of domestic fuel and control technology. (Author)

**A77-48776**      **Development status and environmental hazards of several candidate advanced energy systems.** M. M. Penny, S. V. Bourgeois (Lockheed Research Engineering Center, Huntsville, Ala.), and W. C. Cain (U S Environmental Protection Agency, Industrial Environmental Research Laboratory, Cincinnati, Ohio) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 646-654, 25 refs. U.S. Environmental Protection Agency Contract No. 68-02-1331

This paper presents a review of the development status and anticipated primary environmental hazards of nine advanced energy systems. A summary of federally-funded R&D for these energy systems is also presented. Each of these energy systems has a negligible or mild direct environmental impact when compared with conventional fossil fuel and nuclear systems. Indirect impacts for some of the energy systems could be severe, however, and these systems need further study to quantify their impacts. Considering both expected environmental impact and period of technology breakthrough/commercialization, the systems are ranked in order of decreasing research priority as follows: high temperature turbines, ocean thermal gradients, windmills, magnetohydrodynamics, metal vapor Rankine topping cycles, hydrogen fuel cells, thermionics, electrogasdynamics and thermoelectric conversion. (Author)

**A77-48777**      **Environmental considerations in advanced energy conversion technology assessments.** H. Shaw (Exxon Research and Engineering Co., Linden, N.J.) and W. C. Cain (U S Environmental Protection Agency, Cincinnati, Ohio) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 655-661, 9 refs. U.S. Environmental Protection Agency Contract No. 68-02-2146

The potential environmental problems of advanced energy conversion technologies are being assessed in a three-phase, 30-month program in order to provide information to help plan for solutions during development rather than retrofitting control equipment after these technologies become a commercial reality. The advanced cycles being considered in this program include: open and closed cycle MHD, open and closed cycle gas turbines, liquid metal topping cycles, supercritical CO<sub>2</sub> cycles, fuel cells, advanced steam cycles, and bottoming cycles. The Phase I effort (first year) consolidated the available information on potential pollutants. Phase II (currently under way) will develop models and engineering assessments in order to estimate effluents, pollutants, and waste energy. Phase III will use all the information generated in the program to identify the critical R&D needed to make these technologies environmentally acceptable. (Author)

**A77-48778**      **Environmental assessment of advanced energy conversion technologies.** A. D. Carmichael, J. F. Louis, J. D. Teare, and S. E. Tung (MIT, Cambridge, Mass.) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 662-669, 8 refs.

The paper presents a summary of results of an assessment of the environmental implications of various advanced energy conversion technologies. The overall goal requires modeling of all pollution emission aspects of selected cycles, with consideration of the entire process from raw materials (including fuel) delivered at the plant site to exit of all gaseous, liquid and solid material and energy wastes. This modeling must include the effects attributable to higher temperature and additional cycle complexities compared with those used in conventional power plants. Work reported to date includes thermodynamic evaluation and assessment of selected advanced energy conversion systems, including almost all of the ECAS cycles, plus the Field cycle and the thermionic conversion topping cycle. Examples discussed in the paper include the two latter, and the open cycle MHD topping system. (Author)

**A77-48779**      **A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants.** C. E. Jahng and H. Shaw (Exxon Research and Engineering Co., Linden, N.J.) In: Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 670-674, 11 refs. U.S. Environmental Protection Agency Contract No. 68-02-2146

**A77-48780**      **An environmental assessment of liquid metal topping cycles.** C. E. Jahng and H. Shaw (Exxon Research and

Engineering Co., Linden, N.J.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 675-680 12 refs US Environmental Protection Agency Contract No 68-02-2146

The operation and process flow plan of a liquid potassium topping cycle applied to a conventional utility furnace (CF) and to a pressurized fluid bed (PFB) combustor are described, and the environmental effects of the topping cycle are evaluated. Potassium topping allows a 19% saving in coal consumption together with a 29% decrease in size of the steam, cooling water, and water makeup systems compared to PFB systems without topping. When applied to a base case conventional steam power plant, topping saves 18% in coal and 32% in the steam and water systems. Topping has little effect on emissions when based on heat input or coal consumed, but does improve station efficiency and decrease emissions on an energy output basis. The main environmental danger is the possible formation of KOH fumes in the event of a potassium boiler tube failure, so that scrubbers may be needed P T H

**A77-48781** An environmental assessment of a 638 MWe molten carbonate fuel cell power plant. C D. Kalfadelis, G Cirpios, H H Horowitz, and H Shaw (Exxon Research and Engineering Co., Linden, N.J.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 681-688 16 refs US Environmental Protection Agency Contract No 68-02-2146.

The potential pollution associated with a conceptual base load molten carbonate fuel cell power plant was assessed. The assessment was based on the system design prepared as part of the ERDA/NASA/NSF Energy Conversion Alternatives Study (ECAS). Air pollution is not expected to be a problem. NO<sub>x</sub> produced from air fixation is minimal in this system due to the low temperature of operation (700-750 C). Sulfur is removed from the synthesis gas immediately after coal gasification, and thus is not a problem associated with the steam plant. The major environmental problems are seen to be associated with ash handling and disposal from gasification, and with water treatment and cooling tower operation for the steam plant. In the ECAS program, the cost of electricity was estimated to be 2.87 cents/kWh (mid-1975). Our estimate is 4.4 cents/kWh, primarily due to higher calculated capital requirements (Author)

**A77-48782** Pressurized fluidized bed pilot plant for production of electric power using high sulfur coal. S Moskowitz (Curtiss-Wright Corp., Wood-Ridge, N.J.) and G Weth (ERDA, Washington, D.C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 696-703

This paper describes the five year, multi-phase program which is under way for the design, construction, and operation of a pilot electric power plant producing an equivalent of 13 MW to demonstrate the concept of a gas turbine integrated with a PFB coal combustion system. The development program will address to key technical questions including PFB and turbine durability, maintenance, reliability and environmental acceptability. Unique in this PFB system is the use of 1/3 of the turbine compressor air to fluidize the bed and support combustion, with the remaining 2/3 used to control bed temperature and extract heat through an in-bed gas-to-air heat exchanger. In addition to a two stage hot gas cleanup system, transpiration-air protected turbine blading will be used to prevent erosion, corrosion, and deposition in the turbine (Author)

**A77-48783** Coal fired combined cycle for electric power generation. R D Brooks, J R Peterson (General Electric Co., Schenectady, N.Y.), and G Weth (General Electric Co., Schenectady, N.Y., ERDA, Washington, D.C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La

Grange Park, Ill., American Nuclear Society, Inc., 1977, p 704-711 17 refs

The Coal Fired Combined Cycle (CFCC) is the unique power plant concept which when developed will provide a direct coal-burning gas turbine and steam turbine combined cycle suitable for base load application. The combined cycle operation offers the potential for improved efficiency, and pressurized fluidized bed combustion will provide substantial improvements in lowering the emissions of coal-burning plants for the electric utility industry. The CFCC approach provides cooling of the fluid bed combustor through the use of steam tubes in the bed which supply high pressure, high temperature steam to a conventional steam turbine-generator. Combustion gases are expanded through heavy duty gas turbines which pressurize the combustor and generate additional electric power (Author)

**A77-48784** Fluidized bed adiabatic combustor power plants - Concepts and comparisons. J R Hamm, D L Kearns, and D H Archer (Westinghouse Research and Development Center, Pittsburgh, Pa.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 712-717 6 refs

**A77-48785** The solid-fuel gas turbine for industrial energy production. F R Wocasek and D R Moody (Combustion Power Co., Inc., Menlo Park, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 718-724 5 refs

Steadily increasing costs for energy have spurred a search for new methods of generating energy from low-cost abundant fuels. The development of a gas turbine system that can utilize wood waste in direct combustion is currently in progress. A 1-mW pilot plant has demonstrated the basic concept of the gas turbine and fluid-bed combustion. Areas that are under active development are the control of deposition and corrosion due to process chemistry and erosion control by particulate filtration. Cycle trends of the prospective systems are presented as well as possible configurations for the forests products industry (Author)

**A77-48786** A unitized 500-megawatt fluidized bed boiler design. S L Darling (Combustion Engineering, Inc., Windsor, Conn.) and R H Tourin (New York State Energy Research and Development Authority, New York, N.Y.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 725-730. Research supported by the Electric Power Research Institute and New York State Energy Research and Development Authority

The design concept for a 500 MW fluidized bed boiler consisting of a single unit instead of the usual modular type is proposed. The total bed plan area installed in the boiler is 558 sq m. Two types of beds are used: the main beds and the carbon burn up cell beds. The boiler efficiency is 89.7% P T H

**A77-48787** Analysis of power cycles with centrifugal fluidized bed coal combustion. W J Shakespeare, E K Levy, J C Chen, and V Kadambi (Lehigh University, Bethlehem, Pa.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 731-736 11 refs. Research supported by the Pennsylvania Science and Engineering Foundation, Pennsylvania Power and Light Co., and NSF

Results on the effects of important operating parameters on the thermodynamic efficiencies of a steam cycle and a combined cycle using adiabatic centrifugal fluidized bed combustors are presented and compared to the performance obtained for three power cycles using conventional fluidized bed combustors and for a pulverized

coal power plant with limestone scrubbing. Electrical energy costs are calculated for each cycle for 600, 300 and 30 MWe power plants operating at 65 and 25 percent capacity factors (Author)

**A77-48788 Pressurized fluidized-bed coal combustion** R C Hoke (Exxon Research and Engineering Co., Linden, N.J.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 737-742. US Environmental Protection Agency Contract No. 68-02-1312

The pressurized fluidized bed combustion of coal was studied in a program sponsored by the U.S. Environmental Protection Agency (EPA). Emission of sulfur dioxide, nitrogen oxides and other components in the combustor flue gas, carbon combustion efficiency and heat transfer coefficients were measured as a function of combustor operating conditions. A process design was developed incorporating the estimation of sorbent requirements and boiler design criteria needed to meet EPA emission standards for sulfur dioxide and nitrogen oxides (Author)

**A77-48789 Development of the fluidized-bed carbon-burnup cell** R R Reed (Pope, Evans and Robbins, Inc., Alexandria, Va.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 743-750

The ability to burn the high carbon content fly ash produced by atmospheric fluidized-bed boilers is a prerequisite for attaining overall high combustion efficiencies necessary for utility size power plants. A test program using a multiple point fly ash feeder with a 0.7 m squared cross-section combustor was conducted to further develop the fly ash combustion system. Combustion efficiency over a range of operating variables was determined. High combustion efficiencies in small combustors with only one feed point were found. These tests are part of a program to design, build and operate a 30 MW Multicell Fluidized-Bed Boiler as a pollution-free method of burning high-sulfur coal in a utility application (Author)

**A77-48790 Reducing the environmental impact of solid wastes from a fluidized-bed combustor** I Johnson, G J Vogel, J Montagna, J Shearer, R Snyder, W Swift, and A A Jonke (Argonne National Laboratory, Argonne, Ill.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 751-757. 16 refs

The use of three options for the reduction of the environmental impact of solid sorbents used to control SO<sub>2</sub> emission in fluidized-bed coal combustion systems has been experimentally examined. The three options are: (1) the use of agents such as NaCl to enhance the chemical reactivity of sorbents, (2) regeneration and reuse of limestone, and (3) the use of synthetic sorbents. The quantity of waste generated decreases in the order (1) to (3), the cost increases in the order (1) to (3). At present, both the use of chemical enhancement agents and the regeneration of limestone (or dolomite) appear to be viable options. The high cost, the low SO<sub>2</sub> capacity, and the small decrease in environmental impact obtainable with synthetic sorbents at the present state of development eliminate this option from future consideration (Author)

**A77-48792 Dynamic modeling of fluidized bed boilers for control system design** D A Berkowitz (Mitre Corp., Bedford, Mass.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 765-771. 12 refs. Contract No. E(49-18)-2453

Mathematical modeling techniques applicable to the characterization of fluidized-bed combustion in coal-fired steam-electric power plants are discussed. A fluidized-bed boiler system involving pneu-

matic introduction of coal having a size of one cm into a coarse bed of calcined limestone is described, techniques for adjusting the available heat transfer surface area, including adjustment of bed height and localization of the fluidizing air in the bed, are considered. A linearized dynamic model of an experimental fluidized-bed process plant, based on ten differential equations and several supporting algebraic relations, is derived. A data acquisition system which permits monitoring of the plant operation under a variety of control and output variables is also considered. J M B

**A77-48793 Fluidized-bed combustion of anthracite refuse** J S Mei, R L Gall, and J S Wilson (ERDA, Morgantown Energy Research Center, Morgantown, W. Va.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 772-778. 9 refs

A total of five types of anthracite refuse material with widely different characteristics were successfully burned in the 0.46 m (18-inch) diameter atmospheric pressure fluidized-bed combustor at the Morgantown Energy Research Center of the U.S. Energy Research and Development Administration. Combustion characteristics of these anthracite refuse materials as well as engineering data were investigated for a wide range of operating conditions. Values of carbon combustion efficiency, sulfur dioxide and nitrogen oxides, heat transfer and heat release rates are presented. Results of this systematic study of the fluidized-bed combustion of anthracite refuse material indicate that a substantial amount of heating value contained in this rejected material can be recovered. This application of anthracite refuse represents a potential source of energy for a region of the country which would benefit from such a new source to replace increased oil use which has accompanied the decrease in anthracite coal mining (Author)

**A77-48795 Geothermal well stimulation with a secondary fluid** I Sheinbaum (I Sheinbaum Co., Pasadena, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 798-803. 12 refs

The stimulation of liquid-dominated geothermal wells for maximizing the production of thermal energy is discussed. By injecting a secondary fluid down the geothermal well bore it is possible to optimize the production of a geothermal well and at the same time pump the geothermal heat to the surface. The system can be advantageously utilized for self-flowing and non-self-flowing geothermal reservoirs where the geothermal heat can be employed above ground in the production of power by any of the known power cycles. The use of this stimulation technique eliminates the necessity for down-hole pumping and the associated parasitic losses (Author)

**A77-48796 On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs** G Sandquist, S Swanson (Utah, University, Salt Lake City, Utah), R Stoker, and J Kunze (Idaho National Engineering Laboratory, Idaho Falls, Idaho) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 804-809. 9 refs

An analytical model is proposed for describing the long duration fluid temperature inversions which have been measured in geothermal well shafts at the Raft River geothermal site after cold water reinjection and subsequent free outflow. These anomalous temperature distributions are apparently associated with fracture distributions of varying permeability and anisotropic thermal and mass transport properties. Laboratory model and field data are presented to support the reservoir model. It may be possible through a controlled series of cold water reinjection and free flow experiments to identify and evaluate the producing zones within fracture dominated, hot water geothermal systems (Author)

**A77-48797** **Geothermal space heating - The symbiosis with fossil fuel.** J F Kunze (Idaho National Engineering Laboratory, Idaho Falls, Idaho) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 810-815.

The economic viability of geothermal space heating supplemented by fossil fuel heating systems is discussed, with emphasis on applications of the concept in the 48 conterminous states of the U.S. In particular, expansion of an existing geothermal space heating system in Boise, Idaho is considered. Problems associated with such heating networks, including high capital costs and relatively low utilization factors, are reviewed. It is suggested that a geothermal heating network which would serve a large number of buildings and furnish heat to compensate for outside temperature levels of 20 or 30 F might be complemented by fossil-fuel heating to create a cost-effective system. J M B.

**A77-48798** **Energy extraction characteristics of hot dry rock geothermal systems.** J W Tester and M C Smith (California, University, Los Alamos, N Mex) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 816-823 14 refs ERDA-sponsored research

The Los Alamos Scientific Laboratory Hot Dry Rock Geothermal Energy Project is described. The project investigates the extraction of energy at useful temperatures and rates from naturally heated crustal rock which does not contain large amounts of innate steam or hot water. Methods applicable to formations of low or high initial permeability are considered, in particular, a technique for creating a closed pressurized-water heat extraction loop through production of a hydraulic fracture between two bore holes is mentioned. Fluid-flow and heat exchange calculations indicate that buoyant (unpumped) circulation through a large hydraulic fracture may provide heat extraction at commercially useful efficiencies. Determination of the economic feasibility of hydrothermal systems, based on criteria such as fluid-flow capacity, pressure losses, well and pumping costs, and lifetime of the facilities, is also discussed. J M B.

**A77-48799** **Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations.** C A Allen, O. Fukuda, E S Grimmer, and R E McAtee (Allied Chemical Corp., Idaho Falls, Idaho) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p. 824-831 14 refs.

The heat transfer behavior of horizontal fluidized-bed heat exchangers was investigated, with the emphasis on applications to geothermal systems. Experimental data and published literature were used in devising a model of heat transfer from the fluidizing medium to a wall of the tube in a horizontal liquid-fluidized shell-and-tube heat exchanger. Empirical results were found to correlate well with the heat transfer equations developed by Hamilton (1970). The test data were also employed in modifying the distributor plate of the heat exchanger to achieve uniform flow through the bed material, and in determining preliminary corrosion, erosion and deposition properties of materials under consideration for geothermal applications. J M B.

**A77-48800** **A comparison of three working fluids for the design of geothermal power plants.** D G Shepherd (Cornell University, Ithaca, N Y) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p. 832-841. 14 refs.

Three working fluids for use in binary-cycle geothermal power plants are investigated. The fluids selected for study are the halocarbon refrigerant R-21, isobutane and trifluoroethanol. Condenser, turbine and evaporator sizes needed to attain a range of cycle temperatures, pressures and outputs are determined. It was found that fouling resistance has a major effect on the heat transfer process,

so that the cycle efficiency of the geothermal power plants is a more important factor than fluid characteristics. Because of its superior thermodynamic performance, trifluoroethanol yields the lowest condenser and evaporator sizes, though at high outputs it requires double-flow turbines. J M B.

**A77-48801** **Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California.** J. H. Eskesen (General Electric Co., Medium Steam Turbine Dept., Lynn, Mass) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p. 842-849 Grant No. EY-76-C-02-2619.

A comparison is made of the performance and cost of dual flash organic Rankine (binary) cycles and steam turbine cycles designed specifically to exploit the geothermal resources at Niland and East Mesa in California's Imperial Valley. At East Mesa a steam turbine and binary cycle are compared. At Niland only the binary cycle is analyzed since the high CO<sub>2</sub> content of the resource precludes the use of condensing steam turbines. Turbine designs were formulated and costs established for power plants having a nominal generating capacity of 50MW. Steam and organic turbine generator costs are estimated to be approximately \$200/kW and \$100/kW, respectively, although savings in organic turbine costs are shown to be more than offset by heat exchanger costs and the high cost of organic condensers. Total installed cost for the steam turbine cycle at East Mesa is estimated to be almost \$600/kW compared to \$700/kW for the dual flash binary cycles at Niland and East Mesa, respectively.

(Author)

**A77-48802** **The use of mixture working fluids in geothermal binary power cycles.** K E Starling, L W Fish, K. Z. Iqbal, and H. H. West (Oklahoma, University, Norman, Okla) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill, American Nuclear Society, Inc., 1977, p. 850-856 5 refs. Research supported by the University of Oklahoma and University Engineers, Inc., Contract No. E(40-1)-4944.

The use of hydrocarbon mixtures as working fluids in the geothermal binary power cycles provides certain advantages over systems based on pure component working fluids. The composition of the working fluid can be changed in response to long-term variations in the available geothermal resource temperature. The dew point of a mixture can be customized to permit a lower turbine exhaust temperature, thereby reducing the condenser load. Furthermore, the problem of retrograde condensation can be reduced, allowing the designer to maximize turbine efficiency or reduce the condenser desuperheating duty. The advantages of the use of hydrocarbon mixtures in geothermal binary power cycles are discussed in detail with attention to the effective use of the geothermal resource, thermodynamic efficiency, and cost effectiveness. Calculations using a process simulation program are presented to support the argument that mixtures can be tailored to match the characteristics of the geothermal resource and the limitations imposed by the power conversion cycle. (Author)

**A77-48803** **Geothermal power cycle analysis.** A R Schapiro and G. P. Hajela (Rockwell International Corp., Atomics International Div., Canoga Park, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill, American Nuclear Society, Inc., 1977, p. 857-864. 5 refs.

A study was conducted to analyze and select (from the direct steam flash, flash binary, and direct binary cycles) a power generation cycle producing 10 MW net electric power output, that has the lowest capital cost for two brine models: one for high-temperature/high-salinity brine and the other for low-temperature/low salinity brine. For each cycle, the thermodynamic performance and capital cost were analyzed. The materials

of construction used in estimating the cost of the components were (1) carbon steel and (2) materials selected for each component that shows promise for longer life. Estimates with components constructed of carbon steel were made to give an equal basis to the comparison. The effects of the materials of construction upon the cycle selected were ascertained (Author)

**A77-48804** Multiparameter optimization studies on geothermal energy cycles W L Pope, H S Pines, L F Silvester, M A Green, and J D Williams (California, University, Berkeley, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 865-869 12 refs ERDA-supported research

Various standard geothermal power cycles are modeled and optimized with program GEOTHM. The results are displayed in 3-D isometric form. These graphical plots vividly display the sensitivity of energy cost and other performance criteria as a result of departures from the design operating point. For example, the mutual interaction of energy cost, resource utilization efficiency, and resource temperature as an EC-RUE-RT surface for a range of temperatures between 100 C and 300 C can be studied. Calculation results may be presented for subcritical and supercritical binary cycles with several pure fluids, and on two stage flashed steam cycles for practical noncondensable gas levels (Author)

**A77-48805** Effect of reservoir temperature decline on geothermal power plant design and economics J W Hankin, R A Hogue, T A V Cassel, and T R Fick (Bechtel Corp., San Francisco, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 870-876 Contract No E(04-3)-1124

**A77-48806** Design and field test of a steam powered downhole geothermal pump K E Nichols, D Prigmore (Barber-Nichols Engineering Co., Arvada, Colo.), H Matthews, and J Halat (Sperry Rand Research Center, Sudbury, Mass.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 877-883 Research supported by the Sperry Rand Corp., ERDA, and NSF

A concept for pumping geothermal wells has been designed and tested in a well. The pump work required is extracted from the thermal energy of the brine by a downhole boiler. The resulting steam drives a turbopump delivering pressurized brine to the surface. The exhaust steam is ducted to the surface where it is condensed and returned to the downhole boiler. The TPU (turbine pump unit) utilizes a single stage mixed flow impeller that achieves pumping efficiencies over 80%, driven by a two-stage steam turbine. The shaft is supported by water-lubricated bearings that have been tested at temperatures over 400 F. The pumping tests were successful and it was demonstrated that the steam powered concept is feasible (Author)

**A77-48807** A two-phase rotary separator demonstration system for geothermal energy conversion D J Cerini (Biphasic Engines, Inc., Santa Monica, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 884-892 6 refs

Direct utilization of two-phase geothermal well flow has been investigated experimentally with a rotary separator system. The system tested is a portion of a total-flow concept for geothermal energy conversion that incorporates the features of high efficiency, scale resistance and system simplicity. The first experimental system (two-phase nozzle, rotary separator, and liquid pickup) has demonstrated the ability to convert efficiently geothermal wellhead enthalpy to two-phase flow kinetic energy at the nozzle exit. The

performance measurements show a 36% conversion efficiency. The rotary separator removes the steam from the liquid flow, the liquid pickup converts liquid kinetic energy to either pressure or torque. Component efficiencies for nozzle, separator and liquid recovery were measured as a function of facility steam pressure and quality. Similar tests are in progress at a Brawley, California, geothermal well site to demonstrate performance and scale tolerance (Author)

**A77-48808** Performance of a total-flow impulse turbine for geothermal applications W J Comfort, III (California, University, Livermore, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 893-898 7 refs Contract No W-7405-eng-48

A new, axial-flow impulse turbine was tested at LLL as part of the geothermal energy development program. Engine efficiency of this single-stage, two-phase expander was measured at 23% during a single-nozzle test. Performance predictions of a numerical model agreed with these results. Full-admission performance (based on the numerical-model and attainable nozzle thrust coefficients) indicates that engine efficiency can reach between 38 and 40% with present technology. Improved techniques for analyzing two-phase flow and further reduction of droplet sizes should provide 70% engine efficiency. (Author)

**A77-48809 \*** The helical screw expander evaluation project R A McKay (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 899-903 Contracts No E(49-27)-1000, No NAS7-100

A positive-displacement helical-screw expander of the Lysholm type has been adapted for geothermal service and successfully demonstrated in a 50 kW prototype power system. Evaluation of the expander by tests of a new model in a 1 MW power system under wellhead conditions in selected liquid-dominated geothermal fields is proposed. The objectives are to determine the performance characteristics of the expander and power system over a broad range of operating conditions and also to examine the concept of wellhead power plants. Throttling and fractionation of the fluids from the test wells is planned to simulate a wide range of wellhead pressures and steam fractions. Variation in the expander exhaust pressure is also planned. The investigation will include expander efficiency, corrosion, erosion, scale formation and control, and endurance testing. Interaction studies with the wells and an electric grid are also proposed (Author)

**A77-48810** New turbodrill for geothermal drilling W C Maurer, J D Nixon, L W. Matson (Maurer Engineering, Inc., Houston, Tex.), and J C. Rowley (California, University, Los Alamos, N. Mex.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 904-911. 21 refs ERDA-sponsored research

Development of a high-temperature (275 C) turbodrill for use in drilling thermal wells is described. The turbodrill was developed to meet the directional drilling requirements encountered in completing geothermal wells in hot dry rock, where conventional downhole drilling motors are found to degrade rapidly, due to detrimental effects of the elevated temperatures. The device, which was designed to allow part of the drilling fluid to circulate through the axial thrust roller bearings for lubrication and cooling, has turbine blading that provides four times the torque of existing drill motors. Spare seals were incorporated in the drill mechanism to minimize the number of round trips needed for repairs and replacement. J M.B.

**A77-48811** Thermocorer for geothermal applications. G M. Benson (ERG, Inc., Oakland, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August

28-September 2, 1977, Proceedings Volume 1.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 912-917, 12 refs NSF Grant No. GI-43100.

Thermocorer, a thermo-mechanical core-drill, uses recirculating hot melts and rotating jet-nozzles to produce advance rates 1000 times faster than achieved by the Subterrene and at specific energy consumptions approximating those of conventional rotary drills. Advance is produced by forming a kerf with resulting core and glass-lined bore-hole. The kerf is formed by dynamic thermo-natural-gas-fired Brayton cycle engine that drives a Rankine cycle heat pump. A centrifugal freon compressor is driven directly from the Brayton engine rotating group through a permanent magnet coupling. Unique features that offer high life cycle performance include a hermetically sealed magnetic coupling, air foil bearings, an atmospheric in-line combustor, and a high temperature recuperator. Predicted overall engine efficiency is 27 percent and predicted overall coefficient of performance at the energy source is 0.85 in cooling and 1.0 in heating. (Author)

**A77-48812** Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production. J. R. Schuster, J. L. Russell, Jr., K. H. McCorkle, K. J. Mysejs, J. H. Norman, D. R. O'Keefe, R. Sharp, S. A. Stowell, P. W. Trester, and D. G. Williamson (General Atomic Co., San Diego, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 920-927, 5 refs. Research supported by the General Atomic Co. and University of California.

A three-step thermochemical water-splitting cycle is being developed for the producing hydrogen from nonfossil energy sources. This cycle, which employs sulfur and iodine, can be conducted as an all liquid-and-gas process using concentrated solar heat or heat from a high-temperature gas cooled reactor (HTGR). All chemical reactions have been shown to proceed rapidly and cleanly. In coupling the cycle to an HTGR, process engineering has produced an estimate of 41.4% for net thermal efficiency. Recent favorable chemical data indicate that a considerable increase in efficiency will be obtained for the next flow sheet. Material corrosion testing has shown some commercial construction materials to be candidates for containing portions of the chemical process. (Author)

**A77-48813** Development progress on the Sulfur Cycle Water Decomposition System. G. H. Farberman, R. L. Ammon, C. C. Hardman, and S. Spewock (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, Pa.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 928-932, 5 refs.

The Sulfur Cycle Water Decomposition System is a two-step hybrid electrochemical/thermochemical process, which produces hydrogen electrolytically and oxygen thermochemically. Areas investigated include the electrolyzer, where progress is being made toward demonstrating overall cell voltages of 450 mV at 200 mA/cm<sup>2</sup> - the performance level believed representative of a commercially-sized unit. The evaluation of catalysts for the reduction of sulfur trioxide (from sulfuric acid) to sulfur dioxide and oxygen and the evaluation of structural and heat transfer materials suitable for use in the high-pressure, high-temperature environment of the sulfuric acid vaporization and subsequent reduction are also studied. In addition, the evaluation of process flow sheet modifications to assess the potential process efficiency is considered. (Author)

**A77-48814** Irreversibilities, heat penalties, and economics for the methanol/sulfuric acid process. J. E. Funk (Kentucky, University, Lexington, Ky.) and K. F. Knoche (Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 933-938, 8 refs.

A thermodynamic availability analysis which relies on a step-by-step treatment of entropy production and heat penalty terms to determine process irreversibilities is described. Heat penalties are used as an indicator of the amount of thermal energy evolved by the primary energy source, and as a measure of the overall process efficiency. The analysis is applied to a four-step thermochemical cycle involving methanol production and sulfuric acid decomposition, the effects of each stage of the process on the overall thermal efficiency, capital cost and production cost are given. J.M.B.

**A77-48815** Recent developments in the engineering and chemistry of the ZnSe thermochemical hydrogen cycle. H. H. Otsuki, R. K. Pearson, and O. H. Krikorian (California, University, Livermore, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 939-946, 10 refs. Contract No. W-7405-eng-48.

An improved version of the ZnSe thermochemical cycle for hydrogen production is described. Findings on the ZnCl<sub>2</sub> high temperature steam hydrolysis of liquid ZnCl<sub>2</sub> and on the kinetics of decomposition of H<sub>2</sub>Se are also presented. A preliminary design of a process based on the improved cycle was prepared to examine the overall thermal efficiency and to derive hydrogen production costs. Conceptual designs for several critical equipment items are given and their special features discussed. Overall thermal efficiency of the cycle depends strongly on the ability to recover reaction heats and match them with process heat requirements. Thermal efficiency of the cycle is estimated to be about 42%, the estimated cost for hydrogen production is about \$13.50 per million BTUs. (Author)

**A77-48816** Irreversibilities in thermochemical cycles for hydrogen production by water decomposition. K. E. Cox and M. Natarajan (New Mexico, University, Albuquerque, N. Mex.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 947-950, 12 refs.

**A77-48817** A new family of hydrogen storage alloys based on the system nickel-mischmetal-calcium. G. D. Sandrock (International Nickel Co., Inc., Paul D. Merica Research Laboratory, Suffern, N. Y.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 951-958, 19 refs. Research supported by the International Nickel Co.

A family of low-cost intermetallic hydrogen storage compounds based on the formula Ca(x)M(1-x)Ni<sub>5</sub> has been developed. M is the standard rare earth alloy mischmetal and x can be varied from 0 to 1. The basic properties are presented as a function of x, including pressure-temperature-composition relations, ease of activation, heats of reaction, relative materials cost, melting and other metallurgical considerations, and crystal structure correlations. The system offers several desirable properties including raw materials costs per unit of hydrogen storage capacity less than one-third that of present LaNi<sub>5</sub>, room temperature plateau pressures ranging from 30 to 0.5 atm, very low hysteresis, and easy activation. (Author)

**A77-48818** A hydrogen-halogen energy storage system for electric utility applications. A. Beaufrere, R. S. Yeo, S. Srinivasan (Brookhaven National Laboratory, Upton, N. Y.), J. McElroy (General Electric Co., Wilmington, Mass.), and G. Hart (Energy Development Associates, Madison Heights, Mich.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 1, La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 959-963. ERDA-sponsored research.

A techno-economic assessment is made for a hydrogen-chlorine energy storage system for electric utility load leveling and peak shaving applications. The proposed system consists of a GE Solid Polymer Electrolyte Cell, metal hydride hydrogen storage, and liquid

chlorine/hydrochloric acid storage subsystems. The electrochemical cell operates under high pressure, which facilitates both hydrogen uptake by the metal hydride and production of chlorine as a liquid in the cell. The waste heat from the cell is used for decomposition of the hydride to release the storage hydrogen. Experiments carried out show that it should be possible to attain overall efficiencies above 70% at high power densities (at least a factor of 5 higher than that for advanced batteries). Since the reactants for chemical and electricity generation are stored outside the cell, this system appears quite suitable for electric energy storage applications in both peaking and load leveling cycles. (Author)

**A77-48819 \*** The liquid hydrogen option for the subsonic transport - A status report. P. F. Korycinski (NASA, Langley Research Center, Hampton, Va.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 964-972. 22 refs.

Studies dealing with the use of liquid hydrogen for fuel in subsonic air transport systems are reviewed. Topics of the studies include the possibility for economical production of hydrogen, the problems associated with the efficient liquefaction of the gas, the development of insulation materials and materials for long-lasting liquid hydrogen fuel tanks, the difficulties related to fueling processes and the installation of liquid hydrogen fuel stations at major air terminals, an assessment of the hazards connected with liquid hydrogen fuels, and the engineering and design problems involved in incorporating liquid hydrogen fuel systems into large subsonic passenger aircraft. J. M. B.

**A77-48820** Supercorrodng alloys for generating heat and hydrogen gas. S. S. Sergev and S. A. Black (U.S. Navy, Civil Engineering Laboratory, Port Hueneme, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 973-980.

Supercorrodng magnesium alloys have been developed that react rapidly and predictably with seawater to produce heat and hydrogen gas. The alloys are formed by a mechanical process that bonds magnesium and noble metal powder particles together. The reaction rate has been shown to increase with increasing temperature and increasing noble metal content. A maximum reaction rate exists at an optimum proportion of parent materials. Reaction rates for several noble materials have been determined. The effect of pressure on the reaction has been investigated but not determined. The alloy powders can be sintered to form barstock suitable for self-contained corrodng links. Supercorrodng alloys are superior to previous similar methods for producing heat and gas. (Author)

**A77-48821** Hydrogen separation and production from coal-derived gases using Fe/x/TiNi/1-x/. V. Cholera and D. Gidaspow (Institute of Gas Technology, Chicago, Ill.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 1. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 981-986. 8 refs. Research supported by the Institute of Gas Technology.

Sorbents for use in the low-temperature separation of hydrogen from coal-derived gases containing methane and nitrogen were investigated. Data from experiments involving packed-bed batch reactors indicate that low decomposition pressure alloys of the Fe(x)TiNi(1-x) type were able to extract hydrogen from the methane mixtures in a highly efficient process. However, it was found that carbon dioxide and similar impurities interfere with the hydrogen generation, removal of the impurities or use of more expensive alloys based on lanthanum-nickel series is proposed to circumvent the problem. J. M. B.

**A77-48822** Design of the Montana Magnetohydrodynamics Component Development and Integration Facility. W. D.

Jackson, M. S. Mintz (ERDA, Washington, D.C.), F. Shaffron (Ralph M. Parsons Co., Pasadena, Calif.), R. P. Del Bueno (Gilbert Associates, Reading, Pa.), V. Pearson (Argonne National Laboratory, Argonne, Ill.), and J. D. Plunkett (Montana Energy MHD Research and Development Institute, Inc., Butte, Mont.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 988-994. ERDA-supported research.

The Montana MHD Component Development and Integration Facility, developed by ERDA with the aim of achieving a commercial open-cycle MHD electric power generation system, is described. The 50-thermal megawatt facility was designed to assess the interaction of various MHD components and subsystems. In particular, hot gas flow train elements, including combustors, nozzles, channels, magnets and inverters, are to be studied at the plant. Processes such as coal and seed preparation, combustion air preheating, water circulation and treatment, combustion slag quench and removal, exit gas quench and scrubbing, and wastewater collection are also to be analyzed. J. M. B.

**A77-48823** A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute. J. B. Dicks, K. E. Tempelmeyer, H. P. Markant, Y. C. L. Wu, J. F. Martin, J. W. Muehlhauser, and L. W. Crawford (Tennessee University, Tullahoma, Tenn.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 995-1003. 14 refs. Contract No. EX-76-C-01-1760.

A direct coal-fired MHD facility capable of running continuously at the coal flow rate of 3 tons/hour and intermittently up to one hour continuous operation at a coal flow rate of about 10 tons/hour is described. The facility contains all essential components of a central power MHD station except the air preheater. Current results in seed recovery and SO<sub>2</sub> reduction are reported. The overall objective of this facility is to advance the technology of direct coal-fired MHD components and systems required for MHD power systems operating under simulated central power station conditions. Specific objectives are to resolve technical problems which occur in direct coal-fired MHD systems which moderate-to-high ash carryover with Eastern coals. (Author)

**A77-48824** Progress in channel development for direct coal fired MHD. A. Solbes and S. W. Petty (Avco Everett Research Laboratory, Inc., Everett, Mass.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1004-1014. ERDA-sponsored research.

This paper reviews the progress in the development work of magnetohydrodynamic (MHD) channels for direct coal fired MHD power generation, carried out at AERL. The results of extensive testing in a slagging environment using a 6 lb/sec experimental facility, are presented and discussed. Channel performance characteristics are presented both for diagonal and Faraday mode loading. The local channel behavior and the development of nonuniformities are analyzed together with fault simulation experiments. The results of a 100 hour duration run are presented. Cathode, anode and insulator problems are discussed together with the results of several subsequent tests aimed at evaluating various candidate materials for both anode and cathode walls. (Author)

**A77-48825** Compressed air energy storage for electric utility load leveling. K. G. Vosburgh, D. C. Golibersuch, P. M. Jarvis, J. A. Bast, J. H. Eskesen (General Electric Co., Schenectady, N.Y.), A. S. Mitchell (Fenix and Scission, Inc., Tulsa, Okla.), E. J. Sosnowicz (United Engineers and Constructors, Inc., Boston, Mass.), J. Pepper (Electric Power Research Institute, Palo Alto, Calif.), and S. Serata. In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977,



Proceedings, Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1016-1022 10 refs  
Research supported by the Electric Power Research Institute

The results of a conceptual design of a compressed air energy storage plant employing a solution mined salt cavern located on the McIntosh dome in southwestern Alabama are presented. A weekly storage cycle is used and power is generated at 800 MW for 2000 hours per year. Various design options are discussed, including a plant optimized for peaking duty. An evaluation of the operating economics of the designs, a new method for computing the efficiency of compressed air storage plants, and a discussion of experiments which might be performed at a demonstration plant are also presented (Author)

**A77-48826** Compressed air storage for load leveling of nuclear power plants. Z. S. Stys (Brown Boveri Corp., North Brunswick, N.J.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1023-1030. 9 refs

Air Storage Energy Transfer (ASSET) plants are installations which optimize the operation of predominantly nuclear base-loaded systems by providing for energy transfer to equalize the fluctuations in energy demand. Until a short time ago pumped hydro was the only commercially available system capable of accomplishing the energy transfer. With the advent of the ASSET concept, transfer of the energy can be accomplished using compressed air instead of water as a medium. This paper describes the general concept of ASSET plants as well as the first installation of this type now being built at Huntorf, West Germany (Author)

**A77-48827** Electron beam heated solenoid reactors for fusion power and fissile fuel breedings. J. Benford (Physics International Co., San Leandro, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1059-1065. 9 refs

The use of electron beams to heat linear solenoids and the application of such heating processes to fusion reactors or to fissile fuel breeding are discussed. The mechanisms involved in electron-beam heating of plasma, as well as the processes by which axial heat losses from the plasma occur, are reviewed. Advantages of the electron beam heat process, such as a generation efficiency of 80%, are also considered. In addition, systems involving linear solenoids may offer high beta properties together with linear geometries, making maintenance of plasma stability a simpler problem than for toroidal geometry schemes J M B

**A77-48828** Development status - Binary Rankine cycle waste heat recovery system. H. L. Rhinehart (ERDA, Div. of Conservation, Washington, D.C.), C. P. Ketler (Department of Public Utilities and Public Works, Rockville Centre, N.Y.), and R. K. Rose (Mechanical Technology, Inc., Latham, N.Y.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1090-1094.

This paper presents the status of a program under development by MTI for USERDA and concerns development and demonstration of a binary-Rankine cycle waste-heat recovery system for a Diesel generating set. The demonstration site is located at an existing municipal power plant in the Village of Rockville Centre, New York. The system employs two safe and well accepted power fluids, steam and Freon, and recovers 500 kw from the exhaust of a turbocharged Diesel engine. The two fluid cycle generally exhibits higher thermal efficiency, depending upon gas temperature, than a cycle employing a single power fluid. The steam topping cycle buffers the Freon bottoming cycle so that the system can be applied over a wide range of gas temperatures and not be limited by the stability limits of organic power fluids. The machinery arrangement features two radial

inflow turbines driving a common output gear. Conventional process and refrigeration industry heat exchange components have been adapted for use in the system (Author)

**A77-48829** 600 kW Organic Rankine Cycle Waste Heat Power Conversion System. R. M. Cheek and P. D. Lacey (Sundstrand Corp., Rockford, Ill.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1095-1099

The 600 kW Organic Rankine Cycle Waste Heat Power Conversion System, which can be adapted to heat sources such as diesel engine exhaust, gas turbine exhaust, or industrial process waste heat streams, is described. Design criteria for the waste heat recovery system, including selection of power rating, waste heat temperature range and working fluid, are reviewed, development programs involving 425 or 315 C source temperatures and toluene as the working fluid are discussed. Components of the system, such as the boost pump, feed pump, regenerator, vaporizer, turbine and condenser are also considered. The prototype system developed has the advantages of being adaptable to use with a large reciprocating engine as the heat source, and of accommodating several inches of pressure drop without upsetting the operation of the heat source J M B

**A77-48830** Combined diesel-organic Rankine-cycle power plant. H. E. Soini, P. S. Patel, D. T. Morgan (Thermo Electron Corp., Waltham, Mass.), and S. K. Batra (New England Power Service Co., Westborough, Mass.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1100-1107

Components and performance predictions are given for a combined diesel-organic Rankine-cycle electric power generating system. The organic Rankine system will provide 440 kW of additional power by recovering energy from the exhaust gases of a 2500-kW-diesel engine powerplant. For this system, the increase in power output is 18 percent with no increase in fuel consumption, even though the prime mover is a two-cycle diesel engine with relatively low exhaust gas temperature and the engine back pressure is limited to 1.244 kilopascal (5.0 inches of water). For other prime movers without these limitations, even greater improvement is possible. (Author)

**A77-48831** Energy conversion and storage by CDE /concentration difference energy/ engine and system. N. Isshiki, Y. Maekawa, M. Takeuchi (Tokyo Institute of Technology, Tokyo, Japan), I. Nikai (Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan), T. Akuta (Nippon Steel Corp., Tokyo, Japan), and J. Kamoshida (Shibaura Institute of Technology, Omiya, Japan). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1117-1124. 8 refs

This paper is concerned with a theoretical and experimental investigation of a completely new engine called the CDE (concentration difference energy) engine. The CDE engine utilizes the absorption heat liberated from the exhaust steam absorbed in a thick aqueous solution of inorganic salts as  $\text{CaCl}_2$ ,  $\text{LiCl}$ ,  $\text{NaOH}$  etc. in which the original pure steam boiler is immersed. In the CDE system many kinds of alternative energies are used for the regenerations of used solutions thinned by the CDE engine above, and can be converted into useful power and heat (Author)

**A77-48832** Solar powered steam generation. D. Magnoli, M. Saddy, A. V. de Carvalho, Jr., M. R. Lima Verde Leal (Centro de Tecnologia Promon, Rio de Janeiro, Brazil), J. B. de Siqueira, and T. Oniga (Instituto Nacional de Tecnologia, Rio de Janeiro, Brazil). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1127-1133. 7 refs



Generation of low-pressure saturated steam was investigated conceptually using conventional types of solar collectors. Performance analyses were carried out for single flat-plate collectors with one and two covers, selective absorbing surfaces and honeycomb structure, and for parabolic concentrators with focal axis along East-West or Polar directions. Selection of the best collectors was carried out for 20 deg south latitude, and was followed by computation of the steam outputs for the latitudes of 10, 20, and 30 deg south, for clear days at the equinox, winter and summer solstices. Setting the steam production at around 10 ton/day, 1000 three-square-meter collectors were required. Economic evaluation showed that although the system does not currently compete with conventional steam generation, it might be feasible in the medium term and for remote locations (Author)

**A77-48833 High temperature solar collector with an Archimedes concentrator** Z I Antoniuk and H B Palmer (Pennsylvania State University, University Park, Pa.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1134-1140 14 refs

A 1.5 m-long experimental model of a high-temperature solar concentrator-collector in which argon is employed as a working fluid was studied. Experiments were performed with fluid flow rates covering a range of Reynolds numbers from 200 to 2000, resulting in a fluid temperature rise of up to 285 C in the (axial) flow direction. Maximum temperatures attained by the fluid under no-flow conditions were in the 350-390 C range. A computer model of this system which takes into account most of the influential variables was formulated, temperature profiles that agree with the experimental data at all axial positions within about 10 C were obtained (Author)

**A77-48834 Development status of the fixed mirror solar concentrator** J L Russell, Jr, J R Schuster, and G H Eggers (General Atomic Co, San Diego, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1141-1146 7 refs

The General Atomic Company fixed mirror solar concentrator (FMSC) employs a fixed mirror trough that produces a sharp line focus regardless of sun position. The heat receiver is moved in a circular arc to track the focal line. FMSC modules of precast concrete and glass mirrors are being fabricated to supply a 260 sq m mirror field to Sandia Laboratories for their Solar Total Energy Demonstration Facility (Author)

**A77-48835 Considerations for using solar concentrators in photovoltaic systems** C E Backus, D L Evans, L W Florschuetz, D L Jacobson, and B D Wood (Arizona State University, Tempe, Ariz) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1147-1153 14 refs. Research supported by Sandia Laboratories, NSF Grant No. GI-41894, Contract No. E(11-1)-2590

Concentration of sunlight onto solar cells can reduce the cost of electricity from photovoltaic systems in the near term and possibly even after flat photovoltaic array costs have been reduced by more than an order of magnitude. Cells have been designed especially for high concentrations and have efficiencies as high as present day space cells. The cooling of cells under high concentrations does not seem to be a major constraint. The ultimate cost of these systems depends mostly on the cost per unit aperture of the reflective or refractive surface. Higher efficiency concentration cells are often desirable even if their costs are higher (Author)

**A77-48836 Solar cell array for concentrated sunlight.** G. Yekutieli, A Brandstetter, B. Haber, R Joulzary, E Kritchman, and J Mandelkorn (Weizmann Institute of Science, Rehovot, Israel) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1154-1158 10 refs. Research supported by the Ministry of Commerce and Industry of Israel

The work effort at the Weizmann Institute on high concentration solar cell arrays is described. The results of the study phase of the program, which involved procurement and evaluation of system components, were favorable, and integration of selected components and systems is underway. The criteria developed and the data from solar cells, optics, and tracking tests are discussed. Details of a successful laboratory model 2 axis tracking system are presented. It is concluded that development of high concentration arrays having efficiencies of at least 10% is now possible (Author)

**A77-48837 Photovoltaic applications for the National Park Service** P O Jarvinen, C R Peatfield (MIT, Lexington, Mass.), and H Haiges (National Park Service, Denver, Colo.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1159-1166 ERDA-sponsored research

ERDA has engaged MIT/Lincoln Laboratory in its field tests and applications project for solar photovoltaic systems. This paper describes one of the applications of the project namely, the placement, test and monitoring of solar photovoltaic systems that serve installations of the U S National Park Service (NPS). Attention is given to site selection procedures and an NPS photovoltaic site investigation summary is presented. Of 10 promising sites considered, Natural Bridges National Monument, Utah was selected for the first application. Cottonwood Ranger Station at Joshua Tree National Monument, California represents a good alternative site. B.J

**A77-48839 An assessment of mechanical energy storage for solar systems.** H M Dodd, Jr, R E D Stewart, S G Varnado, E A Aronson (Sandia Laboratories, Albuquerque, N Mex), and G C Chang (ERDA, Washington, D C) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1174-1180 9 refs

The primary objective of this study is to assess the relative merits of various mechanical energy storage systems when used in conjunction with solar and wind sources. This initial study considered flywheel, pneumatic (compressed air) and underground pumped hydro storage concepts. Both thermal and photovoltaic collectors utilizing stationary flat plate through total tracking focused systems were included. For wind collection, a horizontal axis wind turbine was modeled. Electrical load demands from single residences through utility grids were included. Alternative systems were ranked according to levelized, busbar energy cost calculations, and the amount of displaced, conventionally generated electricity also served as a benefit measure (Author)

**A77-48840 Evaluation of a chemical heat storage system for a solar steam power plant.** J Dayan, A S. Foss, and S Lynn (California, University, Berkeley, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings, Volume 2, La Grange Park, Ill, American Nuclear Society, Inc., 1977, p 1181-1188 15 refs. ERDA-supported research

A heat storage system employing the reversible chemical reaction  $\text{SO}_3 \rightleftharpoons \text{SO}_2 + 1/2 \text{O}_2$  is synthesized and integrated with the central receiver and conventional steam power cycle of a solar electric power plant. Heat absorption by the chemical reaction takes

place in the receiver during the day, heat release in a separate reactor produces 36 MWe all night through steam generation at 2400 psi and 1000 F. For optimum use of heat, the storage system needs to be integrated during the daytime with a steam raising system having a power input about 5 times the storage charge rate. The overall efficiency of the combined system (net electrical output/thermal input) is about 35% (Author)

**A77-48841 Thermal energy storage.** B L Pierce, F R Spurrier, and M K Wright (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, Pa.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1189-1194

A discussion of a thermal energy storage subsystem is provided which is integrated into a steam Rankine solar thermal electric power generation system. It uses phase change and sensible heat characteristics of the steam for energy transport and encapsulated salt for energy storage. Direct contact heat exchange is featured in the storage subsystem which has superior thermodynamic performance and equipment simplicity compared to present baseline designs using indirect heat transfer features such as being considered for the Central Receiver Solar Power 10 MW(e) Pilot Plant System integration and operation, thermal performance and mechanical design are discussed (Author)

**A77-48842 Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant.** W D Beverly, W W Engle, and F O Mahony (Boeing Engineering and Construction, Seattle, Wash.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1195-1202. 5 refs. Research sponsored by the Electric Power Research Institute, Contract No. EY-76-C-03-1300

Analytical methods have been developed to support the design and analysis of thermal energy storage (TES) systems for solar thermal power plants employing high temperature Brayton, closed cycle thermal engines with helium or air as the heat transport fluid. System level studies have been undertaken to assess the impact of storage on plant performance, to establish storage system design and performance requirements, and to evaluate various TES design alternatives. Conceptual designs with cost estimates are presented for sensible heat and phase change TES devices. Solar power plant design sensitivity data showing the trades between collector area, storage time, plant performance, plant costs, and busbar energy costs are also included (Author)

**A77-48843 Design of sodium-cooled, central receiver solar power plant.** T L Johnson and W B Thomson (Rockwell International Corp., Atomic International Div., Canoga Park, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1203-1208. Grant No. EG-76-G-05-5178

The design of a 100-MWe sodium-cooled, central receiver solar power plant is presented. A sodium-cooled system has the advantages of good heat transfer, stable coolant flow, and high efficiency. Sodium components either are available now or will soon be available as a result of the sodium-cooled reactor programs. A description of three liquid sodium heat transport systems is presented. Several alternative storage options are examined. The all sodium thermal storage concept using a hot storage tank and a cold storage tank is simple, affords operational flexibility, and effectively decouples the receiver system operation from the steam generator - a substantial operational advantage. A sodium quantity of 15.3 x 10 to the 6th kg is required for 6 h of plant operation on stored energy at 100% of rated power. The sodium-cooled plant initial cost is slightly less than an equivalent water-cooled plant. However, leveled energy costs are 18% lower for the mid-1980's (Author)

**A77-48844 Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design.** J C Grosskreutz, E J McBride, and D C Gray (Black and Veatch, Consulting Engineers, Kansas City, Mo.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1209-1217. Research supported by the Electric Power Research Institute

A conceptual design of a 60 MWe gas turbine solar/electric system has been completed. Four cavity type, ceramic-tube heat exchangers produce the 1800 F air required. The turbine-generator and receiver cavities are located at the top of a 650 foot reinforced tower, which is surrounded by two-axis tracking heliostats. The capital cost of the plant, in 1976 dollars, is estimated as \$1350-\$1660 per kilowatt, depending on heliostat costs. Hybrid operation makes this plant eligible for capacity credit in a utility network. The primary hardware development required is the ceramic tube heat exchanger. Silicon carbide tubes have been thermally cycled, using radiant heat, for over 600 cycles with material temperatures up to 2430 F. No tube failures or material degradation were experienced (Author)

**A77-48845 \* Dynamic modeling and sensitivity analysis of solar thermal energy conversion systems.** C L Hamilton (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1218-1223. 5 refs. Contract No. NAS7-100

Since the energy input to solar thermal conversion systems is both time variant and probabilistic, it is unlikely that simple steady-state methods for estimating lifetime performance will provide satisfactory results. The work described here uses dynamic modeling to begin identifying what must be known about input radiation and system dynamic characteristics to estimate performance reliably. Daily operation of two conceptual solar energy systems was simulated under varying operating strategies with time-dependent radiation intensity ranging from smooth input of several magnitudes to input of constant total energy whose intensity oscillated with periods from 1/4 hour to 6 hours. Integrated daily system output and efficiency were functions of both level and dynamic characteristics of insolation. Sensitivity of output to changes in total input was greater than one (Author)

**A77-48846 1 MWth solar cavity steam generator solar test program.** T R Tracey, F A Blake (Martin Marietta Aerospace, Denver, Colo.), C Royere (CNRS, Odeillo, Pyrenees-Orientales, France), and C T Brown (Georgia Institute of Technology, Atlanta, Ga.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1224-1230. Grant No. EY-76-C-03-1068, Contract No. E(40-1)-4921

The primary objective of this program was to demonstrate the efficient conversion of solar energy to thermal energy in the form of steam as soon as possible. The largest solar test facility available was the 1 MWth facility located in Odeillo, France. Therefore, the test article was designed for testing at the 1 MW level. The test article is a cavity type receiver with an aperture of 1.03 meters. The inner walls consist of blackened steel tubes designed to deliver steam at 8619 kPa and 510 C. The solar testing consisted of a total of 161 hours of which 71.5 hours were at rated operating conditions 8619 kPa, 510 C and 105 hours were at full boiler pressure. The maximum power input was 738 KW. The measured thermal efficiency of the cavity was 92 percent. During the program the receiver was cycled to rated conditions twenty-six times and the boiler was cycled to rated conditions thirty times. In addition, many other transients were encountered including cloud interruptions (Author)

**A77-48847** Deterministic insolation estimates for solar total energy systems. E P French (Rockwell International Corp, Space Div, Downey, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1231-1237, 8 refs Contract No E(04-3)-1210

A simple method of evaluating the solar energy available to a collector is described. Radiation at cloudless times is estimated from the calculated solar position and the seasonally varying properties of a standard atmosphere. Local atmospheric effects are incorporated into two empirical coefficients, a clearness number and a cloud factor, which can be derived from long-term average insolation. The method successfully predicts variations in incident energy as a function of collector orientation and tracking strategy. Net collector energy gains are also well estimated if cloud factors are based on observed average percent possible sunshine (Author)

**A77-48848** Miniature solar-electric power system J E Drummond (Maxwell Laboratories, Inc, San Diego, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1238-1242, 12 refs

The paper describes a small solar power system designed for a single family dwelling. The total system consists of five subsystems: optical, thermal input, thermal-to-electrical conversion, waste heat deployment and control. A typical system would consist of 22 stages of ferroelectric heat engines each using nearly-Carnot cycles and 23 intervening, electrically actuated, heat pipes. Each stage is 30 micrometers thick and each heat pipe 1.7 cm long. A kW converter would fit inside a box 20 cm square by 45 cm high, the converter would weigh 3 kg and would pay back the energy required for mining, refining and combining the materials of which it is constructed in 22 days at a quarter of its peak power output. B J

**A77-48849** Experimental evaluation of a solar/wind-powered space heating and hot water heating system in the Pacific Northwest. A Yamagiwa (Seattle City Light, Seattle, Wash) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1243-1249

**A77-48850** Stimulation of the solar industry by way of the Federal Buildings Program L A Alexander and F A Costello (InterTechnology/Solar Corp, Warrenton, Va) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1250-1254

A computer simulation of the growth of the solar industry involving commercial and federal buildings was performed to investigate the costs and benefits to both the solar industry and the federal government of a solar demonstration program. Using this information, a comparison of a Commercial Demonstration Program (CDP) and a Federal Buildings Program (FBP) designed to stimulate the solar industry is presented. Also given is the response of the solar industry and the consumer market as predicted by the model (Author)

**A77-48851** The Page-Jackson Elementary School solar heating and cooling system. F A Costello, A K Jain, S Kumar, H S. Liers, and W. McEver (InterTechnology/Solar Corp, Warrenton, Va) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1255-1262

**A77-48854 \*** Tests and evaluation of multihundred watt thermoelectric generators at JPL P Rouklove (California Institute of

Technology, Jet Propulsion Laboratory, Pasadena, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1287-1293 Contract No NAS7-100

The multihundred watt (MHW) thermoelectric generator, based on silicon-germanium thermoelectric technology, delivers a nominal power output of 150 watts with an efficiency of about 6%. The two Voyager space probes each use three such generators assembled in tandem on a boom. A total of seven MHW type thermoelectric generators were tested at JPL in support of the Voyager project. The tests consisted of (1) parametric evaluation of the electrical characteristics of the devices over a wide range of output voltage for different values of input power, different operating ambients (air, vacuum), and different internal environments (argon, helium, xenon, mixture of these gases, and vacuum) at different pressures to allow evaluation of the influences of both gas and pressure on the performance of the generator, (2) tests to determine the transient behavior of the generators, and (3) operation of the generator in conjunction with the Voyager spacecraft (Author)

**A77-48855** An assessment of the materials needs for a Kr-85 fuel capsule. N B Elsner, J C Bass, T S Roemer, and P W Trester (General Atomic Co, San Diego, Calif) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1294-1301, 20 refs Army-supported research

Kr-85 is considered as an alternate isotopic heat source in place of others, such as Pu-238 and Sr-90. RTGs using Kr-85 could possibly be used in applications where the nuclear safety requirements are less stringent. Fuel capsules would have to contain the gas at operating pressures up to 69.0 MPa, be compatible at 623 K with the liquid metal Rb, the daughter product of Kr-85, and provide adequate gamma shielding. An overall candidate material for the capsule would be the alloy Ta-10W since it is likely to be compatible with Rb, would offer a high shielding to volume ratio, and would be capable of demonstrating suitable and uniform mechanical properties, a requirement for high-pressure gas containment systems. Five alloys were selected as candidates for fuel capsules. The scope of an initial phase qualification program is presented which deals with verifying both corrosion resistance and absence of degradation of deformation ability and toughness in the candidate alloys after exposure to Rb. Results are presented of a comparison of the weights of similar RTG systems using PuO<sub>2</sub>, SrTiO<sub>3</sub>, or Kr-85 as the heat source materials (Author)

**A77-48856** Terrestrial RTG designs featuring disc-shaped thermoelectric modules P E Eggers (Ridighigh, Eggers and Associates, Columbus, Ohio) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1302-1309

A terrestrial radioisotope thermoelectric generator design is described which features the use of two annular or disk-shaped converters at either end of the heat source. The disk-shaped converters were thermally coupled to the heat source via a threaded interface. Pressure loading was accomplished through the use of tapered threads on the heat source and a resilient, thermally conductive member at the cold side (outer diameter) of the annular converter. In this manner, the heat source is supported by the thermoelectric converters at either end of the heat source. An additional feature of this design is the use of a thermal switch which serves to shunt heat from the heat source to the RTG casing when the casing temperature exceeds a predetermined set point (range) (Author)

**A77-48857** Design of a spherical RTG K. A Kroos and J. E. A. John (Toledo, University, Toledo, Ohio) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C, August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill, American Nuclear Society, Inc, 1977, p 1310-1316, 8 refs

The radioisotope thermoelectric generator is ideally suited for a spacecraft power supply. To date, all RTG's are of a cylindrical design with small individual thermoelectric generators placed along the side of the cylinder. A spherical design with individual generators covering the entire surface has the advantages of less heat loss and improved thermal paths. Problems of construction can be overcome by the use of individual 'plug-in' type thermoelectric generators. The design utilizes silicon-germanium as the semiconductor material for high power output. A heat transfer analysis yielded hot and cold shoe temperatures of 1040 C and 255 C, respectively, with an average surface temperature of 130 C. A power output of 76.6 watts at 14 volts for a 10-year life time was predicted. Specific power was found to be comparable to the SNAP 19 generator but a space reduction of 85% is achieved by not using fins (Author)

**A77-48858** Reactor hybrid-Organic Rankine Cycle Electric Power Systems /ORCEPS/ for space applications. J. E. Boretz (TRW Defense and Space Systems, Redondo Beach, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1317-1322. 6 refs.

There are many new space applications for the 1985 to 1995 time period that will require electric power systems in the 10 to 100 KWe range. An operating life of from 5 to 7 years is desired. To achieve these comparatively high power levels and long life goals at low system weights, both high performance and conservative system design approaches are required. This paper discusses various candidate systems and describes a system which combines the inherent reliability of a static thermoelectric conversion unit with a low development risk dynamic power conversion unit. By employing the heat rejected from the thermoelectric conversion unit as the heat input to the dynamic power conversion unit, high overall cycle efficiencies are obtainable. This results in a light weight, small size system which when employing a U-235-ZrH reactor, with a 12 deg cone angle shadow shield, as a heat source can achieve a system specific weight of 50 to 75 lbs/KWe (Author)

**A77-48860 \*** SEP full-scale wing technology development. R. V. Elms, Jr. (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.) and L. E. Young (NASA, Marshall Space Flight Center, Huntsville, Ala.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1329-1334. Contract No. NAS8-31352.

A technology development program has generated a detail design of a lightweight 25 kW solar array for Solar Electric Propulsion (SEP). The fabrication and test of a full-scale array wing, 32.0 m x 4.06 m, is in progress to demonstrate technology readiness for fabrication, testing and flight of the large area lightweight solar array system. This paper presents the requirements for the 66 W/kg array and the component testing that has been performed to demonstrate technology readiness in the areas of SEP mission environmental survival, zero-gravity flat-fold array retraction, and NDT development testing. A zero-gravity test program was performed in the NASA KC-135 aircraft using a three-panel, full-width segment of the flat-fold array blanket with three degrees of panel stiffening. The full-scale solar array wing being fabricated is composed of three electrical modules, 76 x 200 cm, and mass simulator panels each 76 x 400 cm employing 2 x 4 cm glass slides (4.5 panels) and aluminum mass simulators (35 panels) (Author)

**A77-48865 \*** Technology for power in space. J. P. Mullin and L. B. Holcomb (NASA, Washington, D.C.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1362-1369. 33 refs.

The two distinct future directions of the NASA Space Power Research and Technology Program are toward multikilowatt power levels at low cost and toward very high performance. The develop-

ment of both of these directions is reviewed and attention is given to the underlying conversion technologies: photovoltaic, chemical energy conversion and storage, and thermal-to-electric conversion. Problems of environmental compatibility are briefly discussed. (B.J.)

**A77-48866** Photovoltaic solar power satellites. V. A. Caluori and H. Oman (Boeing Aerospace Co., Seattle, Wash.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1378-1385. 6 refs.

A synchronous-orbit photovoltaic solar power satellite would have a 146 sq km array, a pair of one-km diameter antennas, and deliver 10 GW from its earth station for 30 years. For solar cells the choice is silicon, with an efficiency of not much over 18 percent at standard space conditions, or gallium arsenide with perhaps 21% by 1987, and much better resistance to radiation and less loss as the cell gets hot. Solar-flare protons are the main cause of radiation damage, degrading silicon cells protected by 50 microns of glass to 54% of initial output after 30 years. Thicker covers, weighing 200,000 kg per micron per 100 sq km are not optimum. Power lost by radiation degradation might be compensated by array refurbishment or thermal annealing the cells. Concentrating sunlight is not as useful as previously expected, the reflectors being quickly degraded to 62% reflectance by radiation. Plasma leakage current losses restrict array voltages to around 1500 V at 500 km altitude if electric thrusters operate. In geosynchronous orbit leakage current at 40 kV would be trivial (Author)

**A77-48868** Solar power satellites - A system overview. G. Woodcock (Boeing Aerospace Co., Seattle, Wash.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1391-1398. 7 refs.

Studies sponsored by NASA and ERDA are currently defining the systems, development approaches, and risks and costs for the Solar Power Satellite (SPS) venture and evaluating the probable benefits of the system against these risks and costs. This paper presents a list of requirements that an SPS system must satisfy and provides a definition of the system concept. SPS payback and energy economics, satellite systems design considerations, energy conversion configurations, and SPS development and commercialization are all touched upon. (B.J.)

**A77-48869** Power satellite construction location considerations. E. E. Davis (Boeing Aerospace Co., Seattle, Wash.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1399-1404.

One of the major decisions concerning an operational solar power satellite program is that of whether the satellite should be constructed in LEO (low earth orbit) or GEO (geosynchronous earth orbit). Key considerations such as satellite design differences, construction provisions, operations and environmental factors, transportation alternatives and cost are compared for the two construction location options. Both options have been found to offer desirable advantages. Design and operational factors favor GEO construction, however, transportation cost advantages make the LEO option considerably more attractive. Since a power satellite program would be in competition with other energy sources, the final decision in this matter will be highly sensitive to cost. Should the current trend continue, however, the LEO construction option with an electric orbit transfer vehicle offers the greatest payoff (Author)

**A77-48870 \*** Solar power satellite concepts and potential related space systems. T. E. Redding (NASA, Johnson Space Center, Systems Evaluation Office, Houston, Tex.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1405-1411

Recent parametric studies of alternate SPS design concepts have shown that the concept appears technically feasible. The parametric studies were based on the use of advanced technology silicon solar cells for solar energy conversion. Solar array blanket unit masses of 0.31 to 0.46 kg/sq m were investigated. Conversion efficiencies of 15 to 17 percent air mass zero (AMO at 247 K) with a concentration ratio of two were considered. The systems were sized for a ground power output of 10 GW. To the level of detail studied, no design or operational problems were encountered that did not appear amenable to solution, however, the economic viability of the SPS concepts studied is obviously dependent upon a combination of technology advancement and/or the costs of competitive sources.

(Author)

**A77-48871** Design and analysis of a 5000-MW GaAlAs satellite power system. A. D. Tonelli and W. V. McRae (Rockwell International Corp., Space Div., Downey, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1412-1420. 10 refs.

A satellite power system (SPS) was investigated for delivering 5,000 MW to the utility user on the ground for the post-1990 time period. The SPS is located in a geosynchronous orbit, and utilizes GaAlAs solar cells to generate electrical power which is distributed to the satellite microwave antenna. The antenna converts the dc power into RF power which is transmitted to the ground and is received and collected by a rectenna. The rectenna converts the RF energy back to electrical energy and delivers the dc power to the utility grid. The reference SPS configuration is 2.05 km wide by 26.7 km long. The SPS employs reflective mirrors to enhance the solar energy impinging on the GaAlAs cells which results in a significant weight and cost savings. A concentration ratio of 2 was used for the reflectors in the study. The overall efficiency of the SPS was calculated to be 7.5%, and the weight is 24.15 x 10 to the 6th kg.

(Author)

**A77-48872 \*** Space power system design and development from an economic point of view. G. A. Hazelrigg, Jr. (ECON, Inc., Princeton, N.J.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1421-1427. 8 refs. Contract No. NAS8-31308.

The concept of a satellite solar power system offers a feasible, but unproven, long-range energy alternative. While the basic physics of these systems is understood, many developments are necessary in order to reduce the system cost to the point of being cost-competitive with alternative energy sources. Thus, a substantial technology advancement and verification program, plus test and demonstration satellite programs are necessary before a full-scale satellite can be designed and built. It is important to properly identify those elements of the technology that should be subject to development efforts, the goals of the corresponding development programs and the appropriate funding levels and schedules. Systems studies and designs play a major role in rationally formulating a development program. This paper uses an economic approach to place these studies into a framework for formulating a viable satellite solar power system development plan.

(Author)

**A77-48873** Solar power satellite construction - Issues and needed technology. C. A. Nathan (Grumman Aerospace Corp., Bethpage, N.Y.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1428-1436.

This paper presents an economic assessment of Solar Power Satellite (SPS) construction and identifies an approach to advancing space construction technologies through use of a small shuttle supported construction facility. Description of the ultimate construc-

tion base for a 5000 MW photovoltaic SPS is presented and used as the basis for evaluating the economic implications of plant capital cost, plant capacity, production rate, level of automation and cost of personnel on overall SPS costs.

(Author)

**A77-48874** The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station. L. J. Cantafio, V. Chobotov, and M. G. Wolfe (Aerospace Corp., El Segundo, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1437-1444. 22 refs.

An SSPS concept, the gravitationally stabilized, solid-state satellite solar power station has been identified which alleviates a number of the major technical problems associated with other previously proposed SSPS designs. This paper discusses the evolution of the solid state concept. It describes a specific example which consists of 24 pairs of sun-pointing 385 x 2000-m solar panels, 3 km between centers, attached to a 72-km long, 2-m diameter, low-loss circular waveguide supplying microwave energy to a 797-m solid-state dipole transmitting antenna. The array is passively stabilized by the gradient of the gravitational forces and therefore requires virtually no propellant replenishment servicing. The total satellite weighs approximately 19.5 x 10 to the 6th kg and supplies 5 GW of rectified power at the ground.

(Author)

**A77-48875 \*** Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere. O. E. Maynard, A. H. Katz (Raytheon Co., Wayland, Mass.), and W. E. Whitacre (NASA, Marshall Space Flight Center, Huntsville, Ala.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1445-1452. 11 refs. Contract No. NAS8-31308.

The possible effect of microwave beams transmitted from Solar Power Satellites on the ionosphere has been studied theoretically. Particular attention is given to microwave-beam-heating of the F and D layers and theoretical predictions of such ionospheric modifications are used to determine resulting effects on the transmission efficiency of communication and navigation systems. It is recommended that a three-pronged technology and demonstration program be established to study microwave effects. The program would include theoretical studies, ground-based heating experiments, and an orbital experimental program for phase control of the microwave power transmission system.

B.J.

**A77-48876 \*** Thermoelectronic laser energy conversion for power transmission in space. E. J. Britt and C. Yuen (Rasor Associates, Inc., Sunnyvale, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1453-1460. 7 refs. NASA-sponsored research.

Long distance transmission of power in space by means of laser beams is an attractive concept because of the very narrow beam divergence. Such a system requires efficient means to both generate the laser beam and to convert the light energy in the beam into useful electric output at the receiver. A plasma-type device known as a Thermo-Electronic Laser Energy Converter (TELEC) has been studied as a method of converting a 10.6 micron CO2 laser beam into electric power. In the TELEC process, electromagnetic radiation is absorbed directly in the plasma electrons producing a high electron temperature. The energetic electrons diffuse out of the plasma striking two electrodes with different areas. Since more electrons are collected by the larger electrode there is a net transport of current, and an EMF is generated in the external circuit. The smaller electrode functions as an electron emitter to provide continuity of the current. Waste heat is rejected from the large electrode. A design for a TELEC system with an input 1 MW laser beam was developed as part of the study. The calculated performance of the system showed an overall efficiency of about 42%.

(Author)

**A77-48877** **Optimizing a low cost satellite energy system**  
J E. Drummond (Maxwell Laboratories, Inc., San Diego, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1461-1467 11 refs

The paper describes the Iso-insolation Power Satellite (IPS) system which would, among other things, eliminate localized enhancement of electron density in the ionosphere arising from and deflecting microwave transmission from power satellites, introduce a new satellite form which appears to be an improvement on current designs, significantly reduce power converter mass through utilization of a ferroelectric heat engine, and greatly reduce the size and weight of both the transmitting and receiving antennas due to the much shorter microwave link. It appears that a relatively simple derivative of the Space Shuttle could be used to implement the IPS system, and that - once implemented - such a system could provide power continuously worldwide at a cost significantly lower than fossil or nuclear power. A condition on the system's economy is that it must have load centers distributed throughout the world including the oceans where hydrogen could be produced for mobile vehicle use (Author)

**A77-48878 \*** **Comparative assessment of orbital and terrestrial central power plants.** R Caputo (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1468-1475 Contract No NAS7-100

Recent studies of the space power system (SPS) are integrated into a total social cost framework developed for terrestrial central electric power systems. Total social costs include the projection of commercial economics to the time frame of interest as well as the federal research, development and demonstration (RD&D) costs, the health impacts, the resources required, the environmental impacts and other social costs. The SPS system is limited to transporting all materials from the earth's surface to geosynchronous orbit. Only silicon photovoltaic is considered as the SPS energy conversion technique. Costs and impacts of the LWR are considered as a reference for nuclear systems, and the low BTU coal gasification with combined cycle gas and steam turbines is considered as a reference for a fossil central electric plant. The ground solar systems considered are solar thermal using the central receiver approach with thermal storage, and solar photovoltaic using the silicon cell with battery storage (Author)

**A77-48879** **Thermal oscillators.** G M Benson (ERG, Inc., Oakland, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1478-1487 31 refs

Thermoscillators are resonant-free-piston, valveless, closed-cycle thermal machines. The engine, operating on a Stirling or Ericsson cycle, drives a shaftless load (pump, generator, refrigerator, or combination). The engine and load form a compact, integral, hermetically-sealed, gas-lubricated unit, that self-starts and load-modulates by self-varying stroke, pressure-ratio and piston-phasing without changing working-fluid mass or speed. Results for two- and three-piston Thermoscillators are presented and compared with other free-piston Stirling engines. Data are given for improved heat exchangers, including Thermizers which isothermalize the variable-volume chambers. Results for a Thermoscillator alternator (60 Hz, 120V) give 50% plant efficiencies which, for units using fossil-fuel firing (including fluidized coal) or solar energy, offers a potential for local electric generation with direct waste heat recovery. Results for a Thermoscillator hydraulic pump, isothermal accumulator and hydraulic motor for vehicle drive promise fuel mileages of 100-200 m/gal for urban-cycle and 50-100 m/gal for freeway-cycle (Author)

**A77-48880** **Demonstration of a Free-Piston Stirling Linear Alternator power conversion system.** B Goldwater (Mechanical

Technology, Inc., Latham, N Y) and R B Morrow (ERDA, Nuclear Research and Applications Div., Washington, D C.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1488-1495 6 refs

A program is in progress to develop and demonstrate Free Piston Stirling-Linear Alternator (FPS-LA) energy conversion systems for the Division of Nuclear Research and Applications of ERDA. The major objective of the program is to demonstrate a 2 Kwe conversion system at an overall efficiency of greater than 30%, defined as the measured conditioned power output divided by the measured electrical power to the simulated heat source. The heat sources potentially available for the FPS-LA conversion system are nuclear (both isotopic and reactor), solar, and fossil fuels with external combustion. This paper describes Phase I feasibility evaluations of the engine and the alternator as well as a conceptual system design. B J

**A77-48882** **Practicability study of Stirling total energy systems.** D Lehrfeld (North American Philips Laboratories, Briarcliff Manor, N Y) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2.  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1504-1511 6 refs ERDA-supported research

Under U S ERDA contract, Philips Laboratories has investigated the application of Stirling cycle prime movers to total energy power generation systems. Electrical, heating, and cooling demand profiles for a typical residential complex, hospital, and office building were studied, and alternative Stirling total energy systems were conceptualized for each site. These were analyzed in detail and contrasted with purchased-power systems for these sites to determine fuel-energy savings and investment attractiveness. The residential complex and hospital would be excellent candidates for total energy systems, and prime movers in the 1000 kW output range would be required. Stirling engines with so large an output have not been built to date. The principle advantage of a Stirling prime mover in this application, in view of national concern over present and future dependence on oil, is that it could utilize low grade liquid fuels and coal (Author)

**A77-48884** **A new mathematical model for Stirling cycle machines.** D M Berchowitz, C J Rallis, and I Urieli (Witwatersrand, University, Johannesburg, Republic of South Africa) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1522-1527 7 refs

A mathematical model for Stirling cycle machines is presented in which the effects of pressure difference is made up of two components, viz (1) the time lag for information to propagate along the machine which causes a phase displacement between the expansion and compression pressure profiles, and (2) the real flow effects which cause an amplitude displacement in the pressure profiles. It is shown that both these effects are functions of machine speed, and thus the machine speed becomes a parameter which affects the overall performance. The solutions are presented, one in which only the phase displacement is calculated, i.e., there is no friction and the cycle is otherwise ideal, and the other which includes both phase and amplitude displacements (Author)

**A77-48885** **A new ported constant volume external heat supply regenerative cycle.** C J Rallis, I Urieli, and D M Berchowitz (Witwatersrand, University, Johannesburg, Republic of South Africa) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2  
La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1534-1537 6 refs

The Stirling cycle is but one member of one of the classes of possible regenerative cycles. Also the in-line configurations of heater, regenerator and cooler currently in use are not necessarily optimal

This paper uses so-called first order or ideal thermodynamic cycle analysis to compare the performance of three ideal cycles - the true Stirling, the pseudo-Stirling used in most practical machines, and the so-called ported constant volume cycle. The effects on the dependent variables, of thermal efficiency and specific work, of regenerator effectiveness and volume compression ratio in particular, are considered and it is shown that the characteristics of the ported constant volume cycle are superior to those of the pseudo-Stirling cycle

(Author)

**A77-48886 \*** NASA Thermionic Conversion program J. F. Morris (NASA, Lewis Research Center, Thermionics and Heat-Pipe Section, Cleveland, Ohio) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1540-1547 14 refs

NASA's program for applied research and technology (ART) in Thermionic Energy Conversion (TEC) has made worthwhile contributions in a relatively short time. Materials and designs previously prohibited by in-core nucleonics and geometrics now offer new potentialities. High-temperature material effects are crucial to the level and duration of TEC performance. New electrodes must increase and maintain power output regardless of emitter-vapor deposition on collectors. They must also serve compatibly with hot-shell alloys. And while space TEC must face high-temperature vaporization problems externally as well as internally, terrestrial TEC must tolerate hot corrosive atmospheres outside and near-vacuum inside. Furthermore, some modes for decreasing interelectrode losses appear to require rather demanding converter geometries to produce practical power densities

(Author)

**A77-48887 \*** Thermionic converter studies at Thermo Electron. F. N. Huffman, D. Lieb, and F. Ruffe (Thermo Electron Corp., Waltham, Mass.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1548-1554 19 refs Grant No EX-76-C-02-3056, Contract No NAS3-20302

The Thermionic Energy Converter (TEC) development program includes theoretical and experimental surface studies, diode evaluation, enhanced mode converter investigations and system studies, as well as materials fabrication and testing. The primary effort has been concentrated on increasing converter performance via improved electrodes. Diodes with oxide collectors (i.e., tungsten oxide, titanium oxide, zinc oxide and barium oxide) have provided the best performance. Emitters requiring reduced cesium pressure (such as oxygenated tungsten, lanthanum hexaboride, platinum and graphite) are being tested. Converter configurations using particle spacing are under investigation. Experiments with auxiliary electrode thermionic converters are in progress. Both silicon carbide and alloy hot shells (i.e., barriers to isolate the converter from the combustion environment) have been fabricated and tested.

(Author)

**A77-48888 \*** Thermionic converter performance with oxide collectors. D. Lieb, D. Goodale, T. Briere, and C. Balestra (Thermo Electron Corp., Waltham, Mass.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1555-1562 6 refs Grant No EY-76-C-02-3056, Contract No NAS3-20302

Thermionic converters using a variety of metal oxide collector surfaces have been fabricated and tested. Both work function and power output data are presented and evaluated. Oxides of barium, strontium, zinc, tungsten and titanium have been incorporated into a variable spacing converter. Tungsten oxide was found to give the highest converter performance and to furnish oxygen for the emitter at the same time. Oxygenated emitters operate at reduced cesium pressure with an increase in electrode spacing. Electron spectroscopy for chemical analysis (ESCA) performed on several tungsten oxide collectors showed cesium penetration of the oxide layer, possibly

forming a cesium tungstate bronze. Titanium oxide showed high performance but did not furnish oxygen for the emitter, strontium oxide, in the form of a sprayed layer, appeared to dissociate in the presence of cesium. Sprayed coatings of barium and zinc oxides produced collector work functions of about 1.3 eV, but had excessive series resistance. Lanthanum hexaboride, in combination with oxygen introduced through a silver tube, and cesium produced a low work function collector and better than average performance

(Author)

**A77-48889 \*** Status of research on advanced thermionic converters. G. L. Hatch, W. Rhiner, N. S. Rasor, and L. K. Hansen (Rasor Associates, Inc., Sunnyvale, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1563-1567 7 refs ERDA-NASA-supported research

It is shown that it is possible to controllably and continuously elevate the electron temperature in the plasmatron thermionic energy converter from the emitter temperature to the maintenance electron temperature for the diode arc mode. This ability and the apparent validity of an elementary analytical model of the plasma should make possible the optimization and evaluation of operation under strong ionization conditions for which the plasma resistance should be acceptably low. Measurement of the vacuum space charge arising from the emission from a surface in cesium vapor indicates the presence of a substantial negative ion emission current. Apparatus has been constructed for identifying and directly measuring the flux of positive, negative and neutral species emitted from an electrode surface in a cesium vapor diode. The primary purpose of the investigation is to determine the influence of negative ion emission on the effective work function of thermionic converter electrodes. Initial data indicate the presence of H(-), Cs(-) and possibly C(-) and CH(-)

(Author)

**A77-48890 \*** Low arc drop hybrid mode thermionic converter. K. Shimada (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2 La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1568-1574 ERDA-sponsored research, Contract No NAS7-100

The hybrid mode operation for the reduction of plasma drops is being investigated. This report discusses the results obtained from two molybdenum emitter converters. One converter had a molybdenum collector and the other a nickel collector. The molybdenum collector converter was operated in a hybrid mode (at an interelectrode distance of 1.7 mm) and produced a minimum barrier index of 1.96 eV at an emitter temperature of 1500 K. The arc drop was calculated to be 0.14 eV, using the published results for a molybdenum collector. On the other hand, the nickel collector converter was operated in a conventional ignited mode (at an interelectrode distance of 0.5 mm) and produced a minimum barrier index of 2.1 eV at an emitter temperature of 1700 K. It is tentatively concluded that a large-gap operation of the hybrid mode converter permits the diffusion of cesium ions to a distance in the order of one millimeter for an effective neutralization of electron space charge. By employing a low work function collector (1.55 eV) in a hybrid mode converter with an arc drop of 0.14 eV, it appears that a barrier index as low as 1.69 eV could be achieved

(Author)

**A77-48893 \*** Solar thermionic power systems for terrestrial applications. K. Shimada and M. Swerdlow (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings, Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1590-1601. 12 refs. Contract No NAS7-100.

The results of a feasibility study which showed that a low-temperature, high-efficient thermionic power system can efficiently convert solar energy to electrical energy without heat



transport, as required by most solar thermal systems are described. A 3-dimensional (2-axis tracking) 93 sq m parabolic solar concentrator, consisting of mirrors on a foam glass substrate and designed to a concentration ratio (mirror area/aperture area) of 2000 is considered for producing a design temperature of 1100 C at an efficiency of 74%. A tracking subsystem must track the sun at an accuracy of a nominal plus or minus 1.0 degree for maximum use of the sun's energy. Each complete solar thermionic power system unit rated at about 20 kWe peak can generate approximately 48,000 kWh/yr. In addition, a thermal energy conversion system can be cascaded within the thermionic power system so that the high quality waste heat can be further utilized to increase the net electrical output. Potential applications of a solar thermionic power generation system are remote sites, apartment house complexes, heating and cooling, hydrogen production and large power stations (Author)

**A77-48894** Increased central station power plant efficiency with a thermionic topping system. G O Fitzpatrick, E J Britt (Rasor Associates, Inc., Sunnyvale, Calif.), and G Carnasciali (Foster Wheeler Development Corp., Livingston, NJ). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1602-1609. 6 refs. ERDA-supported research.

Preliminary system studies reported in the past have shown that combined thermionic-steam system efficiencies in excess of 50% may be achieved. The purpose of this study was to evaluate the THX (Thermionic Heat Exchanger) approach to topping on a basis which permits comparison with recent studies of other advanced power systems. An overall power plant efficiency of 46.8% was calculated as compared with an untopped system efficiency of about 36%. The estimated capital cost per installed kw was \$902/kw for a plant coming on line in 2000. Possible methods of increasing overall efficiencies to 52% and reducing capital costs to \$700/kw were identified. The modular nature of the THX units permits their development at relatively low cost. It may be possible to proceed through the pilot plant demonstration stage by retrofitting an older existing furnace in an operating power plant with a small number of representative THX units (Author)

**A77-48895** Evaluation of MHD-thermionic-steam cycles. G Miskolczy and F N. Huffman (Thermo Electron Corp., Waltham, Mass.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1610-1616. 15 refs. Grant No. EY-76-C-02-3056.

Studies of thermionic topped steam power plants have indicated that plant efficiencies up to 50 percent should be possible. Similar results are suggested for MHD topped steam powerplants. The operating temperature range of Thermionic Energy Converters (TEC) complements that of MHD and steam. Initial analyses indicate that plant efficiencies over 55 percent are obtainable from a system of MHD topping a thermionic cycle that is bottomed by a steam cycle. In one of the cycles studied, the steam for the bottoming cycle was generated using a TEC boiler. In this cycle, 37 percent of the net power is produced by MHD, 25 percent by the steam bottoming system. A heat exchanger concept for matching the high energy density of the MHD channel to the flux capabilities of the thermionic converters has been formulated (Author)

**A77-48896** Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills. R D. Preuss, E. O. Suciu, and L. Morino (Boston University, Boston, Mass.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1618-1623. 11 refs. Contract No. E(49-18)-2415.

The problem of a horizontal-axis windmill embedded in incompressible, inviscid flow is considered. The vorticity field present in the undisturbed flow is assumed to be unperturbed by the presence

of the windmill, enabling the use of a potential formulation. Two integral equation methods (for finite thickness and zero thickness blades) are presented. Both methods are formulated in a frame of reference rigidly rotating at constant angular velocity relative to the ground. Fully unsteady transient analysis is performed by numerical solution of the equations at discrete time steps while a simpler oscillatory unsteady analysis is performed by expressing the potential and its normal derivative as complex Fourier series in time. The wake, treated as a doublet layer, is of prescribed geometry. Numerical results are presented showing a good comparison of the methods (Author)

**A77-48897** Some contributions to aerodynamic theory for vertical axis wind turbines. H Ashley (Stanford University, Stanford, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1624-1632. 27 refs. Grant No. AF-AFOSR-74-2712.

A review and modest extensions of quasi-steady aerodynamic theory for performance prediction on Darrieus-type turbines are presented. Results are given for both parallel-axis and curved-blade configurations. Blade stall and variable inflow are neglected; it is hypothesized that unsteady effects support the former approximation down to lower values of tip-speed ratio than hitherto believed. Both profile and induced drag are included, and their influences on power and downwind force are expressed in terms of elliptic integrals. Comparisons are presented with power data from the Sandia 2-meter turbine. Three values of profile drag coefficient are employed, and it is argued that numbers in the range drag coefficient range of 0.015-0.017 are most appropriate to the example chosen. A linearized analysis of unsteady-flow effects on performance is summarized. Calculations suggest that they may be larger than might be expected in view of the low operating reduced frequencies of these machines (Author)

**A77-48898 \*** Experimental data and theoretical analysis of an operating 100 kW wind turbine. B S Linscott, J. Glasgow (NASA, Lewis Research Center, Cleveland, Ohio), W. D. Anderson, and R. E. Donham (Lockheed California Co., Burbank, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1633-1650. 8 refs. Contract No. NAS3-20036.

Part of the cooperative effort between NASA and ERDA has been the design and the erection of an experimental wind turbine by the NASA-Lewis Research Center. This 100 kW turbine, designated the Mod-O, is located at the NASA Plum Brook site near Sandusky, Ohio. Experimental test data have been correlated with analyses of turbine loads and complete system behavior of the 100 kW Mod-O wind turbine generator over a broad range of steady state conditions, as well as during transient conditions. The deficit in the ambient wind field due to the upwind tower turbine support structure was found to be very significant in exciting higher harmonic loads associated with the flapping response of the blade in bending (Author)

**A77-48899** Fluid dynamics of diffuser augmented wind turbines. B. L. Gilbert, R. A. Oman, and K. M. Foreman (Grumman Aerospace Fluid Dynamics Laboratory, Bethpage, N Y). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p 1651-1659. 6 refs. Contract No. E(11-1)-2616.

The Diffuser Augmented Wind Turbine (DAWT) is one of the advanced concepts being investigated to improve the economics of wind energy conversion systems (WECS). Application of modern boundary layer control techniques has reduced the surface area requirements of an efficient diffuser by an order of magnitude. Many parameters that effect the performance of the diffuser system have been examined in small scale wind tunnel tests with a family of compact diffusers, using screens and centerbodies to simulate the



presence of a turbine. Flow field surveys, overall performance, the effect of ground proximity, and the prospects for further improvement are described. The baseline configuration is a conical, 60 deg included angle diffuser with an area ratio of 2.78 controlled by two tangential injection slots. This first generation DAWT can provide about twice the power of a conventional WECS with the same turbine diameter and wind. Economic estimates show that this DAWT can be as much as 50% cheaper than conventional WECS for the same rated power. (Author)

**A77-48900 \*** An assessment of wind-powered generators for navigational aids. G. Herrera, H. Weiner (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.), and D. Nelson (U.S. Coast Guard, Washington, D.C.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1660-1667. 10 refs. Contract No. MIPR-Z-70099-5-50352.

**A77-48901** Design and operational evaluation of a 25 kW wind turbine generator for residential heating applications. D. E. Cromack, W. E. Heronemus, and J. G. McGowan (Massachusetts, University, Amherst, Mass.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1668-1675. 6 refs. Contract No. E(49-18)-2365.

**A77-48902** Segmented and self-adjusting wind turbine rotors. P. F. Jordan and R. L. Goldman (Martin Marietta Laboratories, Baltimore, Md.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1676-1683. 6 refs. Contract No. E(11-1)-2613. An exploration has been made of the concept of aeroelastically self-adjusting rotor blades designed with two goals in mind: one, to keep (at constant rotor RPM) the rotor torque output essentially constant automatically over a large range of wind speeds, two, to have the unsteady aerodynamic forces act as damping forces (rather than as flutter-producing forces). Practical considerations lead to a segmented blade design. The preliminary results concerning both performance and stability of such blades are encouraging. (Author)

**A77-48903** Array power output of non-identical electrical cells. J. Appelbaum, J. Bany, and A. Braunstein (Tel Aviv University, Tel Aviv, Israel). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1686-1692. Energy conversion of electrical cells (photovoltaic, chemical and other cells) are of relatively low power and low voltage levels. The cells are therefore connected in any array to produce the desired power and voltage. The cells are 'nonidentical' in their output parameters, and the parameter dispersions affect the array performance in such a way that the power output is lower than the desired, and hence additional cells have to be added to compensate for the mismatch losses. The paper deals first, in general, with the calculation of array output power of nonidentical cells of any type. A more detailed calculation of the influence of the parameter dispersion on the array output power and the number of cells is given for ideal electrochemical cells. (Author)

**A77-48904** Commercial applications of solar total energy systems. M. G. Boobar, B. L. McFarland, S. J. Nalbandian (Rockwell International Corp., Atomics International Div., Canoga Park, Calif.), and K. E. Smith (Rockwell International Corp., Space Div., Downey, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1693-1699. 14 refs. Contract No. E(04-3)-1210.

A methodology has been developed by Atomics International under contract to the Energy Research and Development Administration to define the applicability of solar total energy systems (STES) to the commercial sector (e.g., retail stores, shopping centers, offices, etc.) in the United States. Candidate STES concepts were selected to provide on-site power generation capability, as well as thermal energy for both heating and cooling applications. Each concept was evaluated on the basis of its cost effectiveness (i.e., as compared to other concepts) and its ability to ultimately penetrate and capture a significant segment of this market, thereby resulting in a saving of fossil fuel resources. The photovoltaic STES appears favorable for applications under 800 kWe, whereas the organic Rankine STES would be more cost effective for larger energy demand applications. Initial penetration of these systems are expected to occur in the north-east for large shopping centers in the 1985-1995 time period. (Author)

**A77-48905** Optimum operating conditions for a cylindrical parabolic focusing collector/Rankine power generation cycle system. M. W. Edenburn (Sandia Laboratories, Albuquerque, N. Mex.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1700-1705. ERDA-supported research.

System operating temperatures, boiler temperatures, boiler pressure, and associated parameters which maximize solar to electric conversion efficiency and which minimize collector/storage/power cycle system cost have been determined for an electrical generation system which uses cylindrical parabolic focusing collectors as a source of heat, a stratified liquid unit for storage, and a Rankine power generation cycle for electrical generation. The study shows that electrical generation efficiency is maximized by using a peak superheat temperature near 635 K, but, when storage cost is considered, the minimum cost system uses a peak superheat temperature near 686 K and a boiler pressure of 2.76 MN/sq m. (Author)

**A77-48906 \*** Gaseous fuel reactors for power systems. J. S. Kendall and R. J. Rodgers (United Technologies Research Center, East Hartford, Conn.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1706-1715. 19 refs. Contract No. NAS1-14329.

Gaseous-fuel nuclear reactors have significant advantages as energy sources for closed-cycle power systems. The advantages arise from the removal of temperature limits associated with conventional reactor fuel elements, the wide variety of methods of extracting energy from fissioning gases, and inherent low fissile and fission product in-core inventory due to continuous fuel reprocessing. Example power cycles and their general performance characteristics are discussed. Efficiencies of gaseous fuel reactor systems are shown to be high with resulting minimal environmental effects. A technical overview of the NASA-funded research program in gaseous fuel reactors is described and results of recent tests of uranium hexafluoride (UF<sub>6</sub>)-fueled critical assemblies are presented. (Author)

**A77-48907 \*** Space construction base operations in support of solar power satellite development. G. G. McKhann (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings Volume 2.

La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1716-1722. Contract No. NAS9-14958.

Development of the Solar Power Satellite (SPS) system for initial operation in the late 1990's requires substantial orbital development activities in the mid-1980's leading to a key system development decision in about 1987. A manned Space Construction Base (SCB) in low-earth orbit is needed to support the SPS orbital development program. The SPS system development issues are defined, along with a candidate development program for resolving

these issues. The development hardware systems of interest for the mid-1980's include (1) a tapered linear array microwave antenna (123 x 125.6 m 'cross') with a 57-kW/rf amplatron output, which is SCB constructed and operated in low-earth orbit initially, and, subsequently, unmanned in geosynchronous earth orbit, and (2) a SCB-constructed and -operated 9 x 14.4 m planar array antenna (358 kW/rf) powered by a 455-kWe silicon photovoltaic solar collector (Author)

**A77-48908** Using Salton Sea Geothermal brines for electrical power. A review of progress in chemistry and materials technology - 1976 Status. G. E. Tardiff (California, University, Livermore, Calif.) In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1723-1732. 18 refs. Contract No. W-7405-eng-48

**A77-48909** Comparative evaluation of technical and economic indices for MHD and thermionic tappers for steam turbine facilities. G. N. Morozov (Akademiya Nauk SSSR, Nauchno-Issledovatel'skii Institut Vysokikh Temperatur, Moscow, USSR). In Intersociety Energy Conversion Engineering Conference, 12th, Washington, D. C., August 28-September 2, 1977, Proceedings Volume 2. La Grange Park, Ill., American Nuclear Society, Inc., 1977, p. 1733-1739

To attain high efficiency in steam turbine (ST) facilities it is necessary to simultaneously increase the temperature and the pressure of the super heated steam. This is technically very difficult because of the low strengths of structural materials at high temperatures. One of the possible and evidently most promising ways of avoiding the simultaneous effect on the equipment of high temperature and high pressure, is to have the steam cycle augmented by a high temperature cycle operating with a relatively low pressure of working fluid. This paper considers two types of high temperature tappers - thermionic energy converters (TEC) and MHD generators (MHDG) - and on the basis of a comparative analysis makes an evaluation of their technical and economic indices (Author)

**A77-48910** Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volumes 1-10. Conference sponsored by the International Solar Energy Society and Solar Energy Society of Canada. Edited by K. W. Boer (Delaware, University, SES, Inc., Newark, Del.). Cape Canaveral, Fla., International Solar Energy Society, 1976. Vol. 1, 402 p., vol. 2, 404 p., vol. 3, 417 p., vol. 4, 436 p., vol. 5, 561 p., vol. 6, 360 p., vol. 7, 403 p., vol. 8, 381 p., vol. 9, 322 p., vol. 10, 281 p. Price of ten volumes, \$250

Attention is given to the roles of international and inter-governmental agencies and ERDA in developing solar energy technologies and policies. Solar energy technology is discussed with consideration of focusing and flat plate collectors, heating and cooling methods, heat pumps, passive systems, retrofit systems, simulation studies, design methods, low, intermediate, and high temperature thermal energy systems, and ocean thermal energy. Photovoltaic conversion, solar energy materials, bioconversion, wind power, agricultural and industrial process applications, solar storage, chemical storage, and solar heating of buildings are also examined. The socio-economic, cultural, and commercial implications of solar energy are discussed. B. J.

**A77-48911** Present state and perspective of solar energy applications in Mexico. E. R. Mayer (Universidad Nacional Autónoma de México, Consejo Nacional de Ciencia y Tecnología, México City, México). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 37-57. 8 refs.

Geographical and climatological conditions in relation to the population growth are reported. A forecast of the energy consumption and of the availability of nonrenewable resources shows the

necessity of developing alternative energy sources. The potential of solar energy applications is analyzed and the present state of research and development in the different Mexican institutions is reported.

(Author)

**A77-48912** Overview of Canadian activities in renewable energy resources. E. P. Cockshutt (National Research Council, Ottawa, Canada). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 79-82

The Canadian federal government energy research and development program is outlined. Major projects, arranged in order of priority are (1) energy conservation, (2) maintenance of adequate oil and gas supplies, (3) use of coal as an oil and gas substitute, (4) use of nuclear power, and (5) development of renewable energy sources. More specifically, the development of renewable energy sources is divided into several program topics, such as hydraulic and tidal, solar biomass, wind, and geothermal. International and national cooperative efforts in research programs are briefly noted. S. C. S.

**A77-48913** Development and implementation of standards for solar heating and cooling applications. R. D. Dikkers (National Bureau of Standards, Center for Building Technology, Washington, D. C.). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 83-90. 6 refs.

Solar-energy program activities being conducted by the National Bureau of Standards (NBS) are primarily centered around projects related to the development and implementation of standards and performance criteria for solar heating and cooling applications. In support of the Energy Research and Development Administration (ERDA) and the Department of Housing and Urban Development's (HUD) solar-energy research and demonstration programs, NBS has prepared interim performance criteria for residential solar-energy systems and test procedures for determining the thermal performance of solar collectors and thermal storage devices. Currently, NBS is developing (1) interim performance criteria for commercial solar-energy systems, (2) intermediate standards for solar heating and domestic hot water systems that can be used in conjunction with HUD's minimum property standards, (3) draft standards for materials (i.e., sealants, cover plates, insulation) to be used in solar systems, (4) plans for establishing a solar-collector testing laboratory accreditation program, and (5) plans for identifying and developing other needed standards in cooperation with various standards-writing organizations. (Author)

**A77-48914** Solar residential demonstration program. D. C. Moore (U.S. Department of Housing and Urban Development, Div. of Energy, Building Technology and Standards, Washington, D. C.). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 91-100

As a matter of national policy, the United States is undertaking to bring about the early, widespread use of solar energy for heating and cooling buildings, providing domestic hot water, and supplying heat for industrial and agricultural processes. The residential portion of the national program addresses the many different issues which, together, are involved in developing a residential market for solar energy. Demonstrations of solar heating and cooling systems will provide information on costs, technical performance, public acceptance and potential barriers to widespread use. The first cycle of demonstration grants is currently underway, and a general solicitation has been issued for the second cycle. (Author)

**A77-48915** Recent Canadian activities in solar heating. J. R. Sasaki (National Research Council, Ottawa, Canada). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1

Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 106-109

Ongoing Canadian activities in solar heating include a feasibility study on solar heating of buildings in Canada, and six solar-heating demonstration projects. Newly initiated activities include a \$550,000 Federal funding program for encouraging utilization of solar-heating systems in buildings, and the construction of a solar-heated Senior Citizen Home in Ontario. In addition, over a dozen privately-funded solar homes have been and are being constructed in Canada. (Author)

**A77-48916** Recent Canadian activities in wind power. R. S. Rang (National Research Council, Ottawa, Canada). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 110-118. 10 refs.

Canadian research and industrial projects involving vertical-axis wind turbines (VAWT) are reviewed. The design of the Magdalen Islands 200 kW VAWT intended to commence operation in October 1976 is examined with attention to test models, planned uses, and expected annual output. The uses of wind power for water supply and as a power source for agricultural equipment in developing countries is considered briefly. The VAWT installed on permanent pack ice in the Beaufort Sea is described, and two sizes of commercially available VAWT are indicated. M. L.

**A77-48917** Recent Canadian activities in biomass. G. E. Timbers and C. G. E. Downing (Agriculture Canada, Engineering Research Service, Ottawa, Canada). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 119-125. 13 refs.

Total Canadian biomass production as food, feed, and lumber is an appreciable 145 million tonnes with an estimated additional 43 million tonnes of pasture. Additional biomass production as agriculture and forestry residues adds another 90 million tonnes. The latter materials, with a crude energy content of about 1650 million GJ, can be considered as a possible source of energy or, through processing, as a source of feed. Conversion of waste biomass to feed would increase the efficiency of land use and could allow some conversion of forage land to cereal production to help meet the future world demands. Canadian studies include methane from animal wastes, fuel from forestry and agricultural residues, and residue modification for feeds, including chemical and physical procedures. The contributions of biomass to energy need to be assessed for both direct and indirect effects and studies underway in various areas should aid in the assessment both in terms of conventional and energy economics. (Author)

**A77-48918** The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report. R. D. Scott (ERDA, Div. of Solar Energy, Washington, D.C.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 126-141. 10 refs.

**A77-48919** The current technology for solar heating and cooling. F. H. Morse (ERDA, Div. of Solar Energy, Washington, D.C.), J. D. Balcomb, and J. E. Perry, Jr. (California, University, Los Alamos, N. Mex.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 142-150.

The state of the art of solar heating and cooling technology is reviewed for the following areas: solar collectors, thermal energy storage, solar air conditioning and heat pumps, systems and control, and non-technical (economic, social, environmental, etc.) aspects. The following applications of such technology are considered: swimming pools and domestic hot water, service hot water, and the space heating and solar cooling of residences. It is shown that the

major problem associated with such technology still to be addressed is cost effectiveness. The state of the art varies greatly in terms of components and applications, with solar cooling generally less developed than solar heating. B.J.

**A77-48920** Prospectus on commercialization of solar heating and cooling systems. P. D. Maycock, L. O. Herwig, and R. H. Bezdek (ERDA, Div. of Solar Energy, Washington, D.C.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 151-164. 11 refs.

In support of ERDA planning, three contracted studies have been performed to provide background data and projections of demonstration results on solar heating and cooling systems. These studies were carried out by General Electric, Intertechnology Incorporated, and Arthur D. Little Corporation. It was indicated that a total of 600-700 residential and 150-200 commercial demonstrations should be established between 1975 and 1979. Market penetration simulated by these demonstrations is forecast to result in an annual solar installation rate approaching 1% of new building starts by 1980 and 10% by 1985. Annual savings of 0.2 x 10 to the 15th BTU of exhaustible energy resources are estimated to accrue by 1985 and 1.4 x 10 to the 15th BTU by 2000. B.J.

**A77-48921** ERDA/USDA Agricultural Solar Thermal Energy Program. W. R. Cherry and W. W. Auer (ERDA, Div. of Solar Energy, Washington, D.C.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 165-175. 11 refs.

A five year interagency agreement between the Division of Solar Energy of ERDA and the Agricultural Research Service for USDA is designed to develop solar energy systems which will be suitable for application to on-farm thermal energy needs. Annually, proposals are evaluated and recommended for funding by the USDA-ARS to ERDA in the areas of grain and crop drying, the heating of greenhouse/rural residences and livestock shelters. Over 40 projects are currently under way showing how solar energy can provide significant amounts of the heat for the drying of corn, sorghum, soybeans, wheat, rice, tobacco, peanuts and the warming of greenhouses/rural residences and shelters for poultry, swine and dairy cattle. Some of the systems are already showing economic soundness when compared with conventional fuels, while others, such as grain drying, will require that the solar systems are used for multiple purposes to justify their initial investment cost. (Author)

**A77-48922** ERDA Solar Thermal Energy Program for industrial process heat. W. W. Auer and W. R. Cherry (ERDA, Div. of Solar Energy, Washington, D.C.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 176-185. 6 refs.

To encourage the application of solar energy to industrial processes, ERDA has implemented a phased program of solar system application experiments and demonstrations to show the potential for supplying a significant amount of industrial energy, thus reducing U.S. dependency on fossil fuels. Included in the program are surveys to identify those industries and processes where solar thermal energy systems are technically and economically feasible. Four industrial process hot water and six drying/dehydration applications are presently in Phase I analysis and design activity. In addition, a shallow solar pond prototype system for supplying hot water to an uranium milling plant is in operation. (Author)

**A77-48923** Summary of the role of planning and analysis in the development of the Federal solar energy program. L. O. Herwig (ERDA, Div. of Solar Energy, Washington, D.C.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint

Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1  
Cape Canaveral, Fla., International Solar Energy  
Society, 1976, p 189-210 60 refs

The main purpose of this paper is to describe the scope of planning and analysis and summarize the projects that have guided the growing Federal efforts to develop solar energy technologies. Planning and analysis includes studies involving mission analysis, comparative system evaluation, application selection, preliminary system design, and engineering and economic evaluation. As planning methodology has evolved and expanded over the past three to five years, the results of the planning studies have influenced direction, content, schedule and goals of the Federal solar energy program. A review is given of planning projects in each of a large number of important subprogram areas of solar technology research, development and demonstration. References to the results of these planning studies are given as they are now available (Author)

**A77-48924** The climatology of available solar energy for Canada J E Hay (British Columbia, University, Vancouver, Canada) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 211-225 10 refs  
Research supported by the National Research Council and Department of the Environment of Canada

It is shown that in mid-winter months in Canada, there is a large relative difference in the radiation environment of a surface which is horizontal and one which is steeply sloping and south-facing. Data for eight southern Canadian locations are analyzed to show optimum solar-collector orientation (tilt and aspect) and the sensitivity to deviations from the optimum. It is found appropriate, without long-term storage, to optimize for mid-winter situations. The ultimate value in available solar energy is determined by using a tracking surface, this configuration showing little improvement over a steeply sloping south-facing surface in mid-winter. By increasing the reflectivity of the ground immediately in front of the collector, it is possible to produce a substantial increase in the total short-wave radiation collected B J.

**A77-48926** Distribution of direct and total solar radiation availabilities for the USA E C Boes, I J Hall, R R Prairie, R P Stromberg, and H E Anderson (Sandia Laboratories, Albuquerque, N Mex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 238-263 6 refs.  
ERDA-sponsored research

**A77-48930 \*** Insolation data for solar energy conversion derived from satellite measurements of earth radiance M P Thekaekara (NASA, Goddard Space Flight Center, Greenbelt, Md.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 313-328

Detailed knowledge of the irradiance of the sun at ground locations is essential for the design and evaluation of solar energy conversion systems. The primary source of such data is the global network of weather stations. Such stations are often too far apart and for most locations the data available are only daily total irradiance or monthly averages. Solar energy conversion programs require insolation data with considerably higher geographical and temporal resolution. Meteorological satellites gather routinely extensive data on the energy reflected and scattered into space by the earth-atmosphere system. A program has been initiated to use such data for deriving ground insolation for energy conversion. Some of the preliminary results of this program will be discussed (Author)

**A77-48932 \*** Experimental and theoretical studies on solar energy for energy conversion A P Thomas and M P. Thekaekara (NASA, Goddard Space Flight Center, Greenbelt, Md.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint

Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1  
Cape Canaveral, Fla., International Solar Energy  
Society, 1976, p 338-355 12 refs Research sponsored by the  
National Research Council and NASA

This paper presents the results of investigations made experimentally and theoretically to evaluate the various parameters that affect the amount of solar energy received on a collector surface. Measurements were made over a long period of time using both pyranometer and pyrhelometer. Computation of spectral and total irradiance at ground level have been made for a large variety of combinations of atmospheric parameters: for ozone density, precipitable water vapor, turbidity-coefficients and air mass. A study of the air mass as a function of irradiance measured at GSFC, and comparison of the data with the computed values of total direct solar irradiance for various parameters indicate that turbidity changes with time of the day, atmospheric opacity is less in the afternoon than in the morning (Author)

**A77-48933** Determination of average ground reflectivity for solar collectors. B D Hunn and D O Calafell, II (Clarkson College of Technology, Potsdam, NY) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p 356-362 6 refs

This paper presents a systematic method for the determination of average ground reflectivities for solar collectors which view a wide variety of landscapes. The method is based on photographs of representative landscapes taken with an 8-mm, 2.8 Fisheye Nikkor lens used to simulate the field of view seen by a tilted flat-plate collector. Results are reported for an application of the method to 12 representative winter landscapes. An average ground reflectivity of 0.6-0.7 is determined to be accurate for most rural landscapes in winter where snow cover is predominant, except for locations adjacent to open bodies of water where a considerably lower reflectivity is obtained. For urban areas in winter the range of ground reflectivity is 0.16-0.49, depending greatly upon the landscape composition. (Author)

**A77-48934** Methods for estimating total flux in the direct solar beam at any time L. L. Vant-Hull (Houston, University, Houston, Tex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 1. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 369-375 6 refs  
NSF Grant No. GI-394J6

Most models used for estimating available solar beam energy are relatively cumbersome to use because they consider the detailed spectral character of the attenuation process. If such information is not of interest, several short tabulations giving the direct beam intensity for a few elevation angles are available. A number of such tabulations are fitted with analytic functions. These functions may be easily evaluated for any solar elevation (and in one case, as a function of precipitable water overhead). The resulting functions fit most of the tabulated data to about + or - 0.5% in absorptivity, allow convenient interpolation between the tabulated points, and are designed to behave reasonably under extrapolation (Author)

**A77-48935** Solar collectors. K G T Hollands (Waterloo, University, Waterloo, Ontario, Canada) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. R1-R7. 36 refs

Current research and development activity on solar collectors for heating and cooling of buildings is reviewed. Topics covered include reduction to practice, fundamentals of flat plate collectors, collector testing, selective surfaces, heat reflecting glass, honeycomb collectors, evacuated collectors, and concentrating collectors of the V-trough, compound parabolic, and linear Fresnel lens types (Author)

**A77-48936** Thermic diode solar panels - A brief summary S Buckley (MIT, Cambridge, Mass.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 1-23 Research supported by the Cabot Solar Energy Fund, NSF, and ERDA

Thermic diode solar panels for use in heating buildings are described Each panel combines all the necessary elements of a complete solar energy system (collector, controls, storage, heat exchangers and ducting) into a four by eight foot module No moving parts or external power are involved Thermic panels are also compared to other solar heating systems, such as air heating and water heating The economics of thermic panels are determined using a computer simulation of a typical house under actual weather conditions for eight different climate types The resultant heat savings over the life of the panel are compared to the panel's installed cost The panels are found to be economic in some areas of the country even under the most conservative projections involving oil heating at constant real energy costs (Author)

**A77-48937** The use of planar reflectors for increasing the energy yield of flat-plate collectors S L Grassie and N R Sheridan In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 24-38 5 refs Research supported by the University of Queensland and Texas Tech University

A mathematical model to simulate the performance of flat-plate collector-reflector systems is presented First the collector energy balance is modified to account for the reflected energy Then the exchange area for a diffuse reflector is obtained by integrating over both reflector and collector surfaces For the specular reflector, the collector area exposed to reflected radiation is calculated from geometrical relations Shading effects are also found from the system geometry Fair agreement is obtained between the model and some experiments on a water heating collector in Brisbane, Australia. Finally, the model is used to predict the annual performance of a water heating system with several values of the reflector angle (Author)

**A77-48939** Performance and analysis of 'Solaris' water-trickle solar collector J T Beard, F A Iachetta, L U Lilleleht (Virginia, University, Charlottesville, Va.), F L Huckstep, and W. B May, Jr In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 46-63 16 refs. Contract No E(40-1)-4927

An outdoor solar collector test facility has been designed and constructed for performance evaluation of Thomason 'Solaris' water-trickle solar collector panels Two full-size (1 2 m by 4 9 m) collector panels are tested simultaneously on each of two test stands, so that various design and operational variables are evaluated under the same ambient conditions The test facility design and its operation are based on the 'Method of Testing for Rating Solar Collectors Based on Thermal Performance' recommended by the National Bureau of Standards Results are compared to published results of other single- and double-glazed flat-plate collectors A method is also developed for using performance results for design applications (Author)

**A77-48940** Performance of an evacuated tubular collector using non-imaging reflectors G R Mather, Jr and D C Beekley (Owens-Illinois, Inc., Toledo, Ohio) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 64-78

Specular reflectors have been found to improve significantly the performance of the Owens-Illinois evacuated tube collector Two types of specular reflectors, both of which are nonimaging and result

in moderate concentration ratios, have been investigated in detail Both collect diffuse light efficiently, and neither requires tracking of the sun The results of optical analysis and experimental tests of the two reflectors are described, and compared with similar results for the diffuse reflector used with present Owens-Illinois tubular collectors Energy outputs of the collector are found to increase by 25-35% when the diffuse reflector is replaced with either of the specular reflectors (Author)

**A77-48941** A method of comparing flat-plate air and liquid solar collectors for use in space heating applications. R. L. Oonk, G O G Lof, L. E Shaw, and B. E. Cole-Appel (Solaron Corp., Commerce City, Colo.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 83-93. 8 refs.

An investigation is conducted concerning a suitable approach for comparing the performance of different types of solar heating systems. In the liquid collector system considered, an antifreeze solution passes through the collector and transfers the solar energy which it received to a second fluid loop (usually water). In the typical air system, heated air from the collector is directed either to the space for heating or to a pebble bed storage. In the traditional method, the collector efficiency is plotted against a parameter obtained by dividing the difference between the collector inlet temperature and the ambient temperature by the solar radiation incident on the collector plane per unit area. It is found that this traditional plot is not useful in the considered comparison. A useful comparison technique should include the effects of other system components which contribute to system performance. G.R.

**A77-48942** Performance of air-cooled flat plate collectors B E Cole-Appel (Solaron Corp., Denver, Colo.) and R D. Haberstroh (Colorado State University, Fort Collins, Colo.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 94-106 17 refs

An analytical scheme using a simple linear model is employed to compare the thermal performance of five flat-plate solar air heater designs The air heaters differ with respect to the location of their flow channel, which may be above and/or below the absorber plate. In addition two of the air heater designs studied have area added to the absorber plate in the form of fins Performance curves are found for the different collector designs by solving the sets of simultaneous equations obtained from the energy balances on the collector components The efficiency of a solar flat-plate collector, defined as the amount of useful energy collected per unit area divided by the insolation, can be improved by five to ten percent if fins are added to the flow-side of the absorber plate An optimum fin spacing based on a fin density was found to be dependent on solar flux and mass flow rate For the long fins studied, it appears that a fin density greater than 10 to 20 fins per inch does not significantly improve performance (Author)

**A77-48943** Predicted daily and yearly average radiative performance of optimal trapezoidal groove solar energy collectors. R B Bannerot and J R Howell (Houston, University, Houston, Tex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 111-124 8 refs ERDA-supported research

**A77-48944** A heat transfer criterion on the geometric configuration of flat solar water heaters S Lin (Concordia University, Montreal, Canada) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 129-137

The concept of using extended surface for increasing overall heat transfer coefficient is not applicable to the sheet-and-tube type of solar absorber. The available heat transfer surface of a sheet-and-tube solar absorber is not effectively used. An outline of an effective heat transfer solar absorber is proposed. (Author)

**A77-48945** Thermal, fluid flow and mechanical performance characteristics of a subatmospheric pressure, distributed flow flat plate collector. D L Spencer, T F Smith, and D E Laughlin (Iowa, University, Iowa City, Iowa) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 146-159

**A77-48946** A proposed method of rating the thermal performance of solar collectors B W Tlemat, E D Howe, and R E Buckland (California, University, Richmond, Calif.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 160-172 11 refs

The majority of the performance data on solar collectors in the current literature show the instantaneous efficiency of the collector, as suggested by Whillier (1961) and elaborated by Hill and Kusuda (1974) for the National Bureau of Standards (NBS). It is proposed that, in addition to the NBS interim method, collector performance be measured and displayed in a manner similar to that of solar stills, diurnal efficiency would be plotted as a function of diurnal solar radiation intensity incident on the plane of the collector, with the temperature difference between the fluid in the collector and ambient air used as a parameter. Furthermore, it is proposed that a selected collector be tested over an extended period of time and under a variety of conditions of tilt angle and other variables so that its performance can be well charted. It would then be used as a standard for comparison purposes. (Author)

**A77-48947** A site sensitive solar collector evaluator R E Ferguson (Teledyne Brown Engineering, Huntsville, Ala.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 173-192 5 refs

A digital simulation model has been developed to act as an analysis tool in design and optimization studies of solar collector subsystems. Since many factors governing the collector performance are directly affected by the collector location and orientation, equal emphasis is placed on the definition of the energy processes within the collector and environmental forcing functions. Collector performance parameters are based on a day of operation rather than the often misleading instantaneous performance. (Author)

**A77-48948** Use of calculated displaced shapes to define the reflected light pattern from a focused collector. C S Hoyle (Sandia Laboratories, Livermore, Calif.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 208-219

A program has been developed to analyze the reflected light pattern from slightly curved flat plate collectors. The deflected shapes of the mirrors can be defined by means of finite-element calculations or analytical expressions. The current version allows the comparison of the reflected light patterns from an externally defined shape, a spherical shape, or either of two round plate analytical solutions. Besides the deflected shape of the mirror, the input includes the direction of the light source and the distance to the focusing point of interest. The resulting reflected light pattern is plotted as it would appear on a plane at the specified position. The program also has the capability to search for the minimum reflected spot size. (Author)

**A77-48949** Mathematical modeling of solar concentrators F Biggs and C N Vittitoe (Sandia Laboratories, Albuquerque, N Mex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 220-234

A computational capability that models the operation of any solar energy collector that uses flux concentrators is a valuable aid in the planning, design, construction, calibration, safety analysis, and operation of the system. In addition to the usual optical considerations, the model should treat such imperfections as reflecting-surface slope errors, sun-tracking and alignment errors, and mirror-focusing errors. It should properly account for the angular distribution of incoming sun rays and the effects of atmospheric transmission on this distribution. A model with these capabilities is described, and two computer programs for implementing it are illustrated. (Author)

**A77-48950** Design considerations for parabolic-cylindrical solar collectors. G W Treadwell (Sandia Laboratories, Albuquerque, N Mex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 235-252

The design of a parabolic-cylindrical solar collector using a commercial organic heat transfer liquid in uniflow receivers is discussed. In particular, the geometry and size of the reflector system is considered, the characterization of slope errors on parabolic surfaces, the determination of optimal outer tube diameters for the receivers, as well as difficulties associated with solar tracking, are treated. The influence of asymmetric fluid heating on the design of the collector system is also reviewed. Several techniques for increasing the efficiency of energy distribution through the collector fluid, including the use of internal rods to promote annular flow or the use of copper receiver tubes to transfer energy circumferentially, are mentioned. J M B

**A77-48951** Reduced drag, paraboloid type, solar energy collectors P J Vermeulen (Calgary, University, Calgary, Alberta, Canada), A Bader, and P Elfner In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 264-274

The design and development of two paraboloid-type solar energy collectors of reduced wind drag is presented. The designs are aimed at reducing drag forces from winds nominally from the lateral and the frontal direction. The designs consist essentially of conical frusta mounted to produce a front-focus mirror in one case and a rear-focus mirror in the other. The frusta are mounted so that annular gaps for air flow are presented laterally in the first and frontally in the second. In the first design, interference by the focal-plane energy-receiver device produces the usual collector area loss, but in the second design there is no such interference loss. Wind-tunnel models of both designs have been tested, and the resulting drag-force data are presented and discussed. The data show that significant drag reduction is possible. A 0.914-m dia prototype of the front-focus design has been constructed, and the results of calorimetric measurements are presented. (Author)

**A77-48952 \*** An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator L J Hastings, S L Allums (NASA, Marshall Space Flight Center, Huntsville, Ala.), and R M Cosby (Ball State University, Muncie, Ind.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 2 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 275-290 5 refs

Plastic Fresnel lenses for solar concentration are attractive because of potential for low-cost mass production. An analytical and experimental evaluation of line-focusing Fresnel lenses with application potential in the 200 to 370 C range is reported. Analytical

techniques were formulated to assess the solar transmission and imaging properties of a grooves-down lens. Experimentation was based primarily on a 56 cm-wide lens with f-number 1.0. A sun-tracking heliostat provided a non-moving solar source. Measured data indicated more spreading at the profile base than analytically predicted. The measured and computed transmittances were 85 and 87% respectively. Preliminary testing with a second lens (1.85 m) indicated that modified manufacturing techniques corrected the profile spreading problem. (Author)

**A77-48953** Characteristics of the concentrated solar flux produced by the FMSC prototype. S. Y. Harmon, C. E. Backus, and R. Pinón (Arizona State University, Tempe, Ariz.). In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 2*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 291-303.

Intensity profiling showed the focal zone of the Fixed Mirror Solar Concentrator (FMSC) to have a fairly well-defined symmetrical focus. The intensity in the focal zone varied a maximum of thirty percent along the z-axis of the concentrator. Radiometric analysis indicated a large part of the flux in the focal zone to be within a width of 2 cm. Further studies using larger absorbing surfaces supported this result by showing that seventy percent of the flux incident on an absorber approximately 10 cm wide fell within a strip 2 cm wide. It is suggested that secondary reflectors could significantly improve the performance of this concentrator. These conclusions were further supported by the results gained when comparing the performance of a solar cell array one cell wide with that of an array two cells wide. Work with solar cell arrays indicates the FMSC to be capable of producing concentration ratios of around twenty. (Author)

**A77-48954** The performance of a stationary reflector/tracking absorber solar concentrator. A. M. Clausen. In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 2*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 304-326. 7 refs.

A fixed segment of a concave, spherical mirror can be used to concentrate beam radiation onto a tracking absorber which pivots about the center of curvature of the mirror. A possible economic advantage of the system over concentrating collectors with tracking mirrors is reduced mirror cost. The characteristics of this system are analytically studied. The strong influences of the rim angle of the spherical segment, the angle of incidence of the rays of the sun, and the absorber temperature are established. The role of other important parameters is also determined. Using the efficiency of a Carnot cycle, the daily and yearly variations of the power produced by the system are presented. (Author)

**A77-48955** Collector with cusplike compound parabolic concentrator and selective absorber. A. Rabi (Argonne National Laboratory, Argonne, Ill.). In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 2*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 327-335. 15 refs. ERDA-supported research.

A nonevacuated solar collector with a cusplike compound parabolic concentrator (CPC) and tubular absorber has been built. Since the reflector surrounds the absorber on all sides, little insulating material is needed. Furthermore, the quantity of absorber material relative to unit collector aperture is smaller than in any other collector of comparable acceptance angle. This feature optimizes both transient response and heat transfer from absorber surface to fluid. The collector has been constructed as a panel 90 cm x 180 cm with seven parallel CPC troughs, approximately 20 cm deep. The 0.64-cm OD absorber tubes have been coated with black chrome. The concentration ratio (aperture/tube perimeter) is 6.5, and the acceptance angle is 13 deg, necessitating only seasonal tilt adjustments. Optical efficiency of 60% and U-values around 1.6 W/sq m-C have been measured with individual reflector modules, in-

dicating that the complete collector can operate with 44% efficiency at plate temperatures 100 C above ambient. (Author)

**A77-48956** Optical and thermal design considerations for ideal light collectors. N. B. Goodman, R. Winston (Chicago, University, Chicago, Ill.), and A. Rabi (Argonne National Laboratory, Argonne, Ill.). In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 2*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 336-350. 13 refs.

The design of practical compound parabolic solar concentrators is discussed. Problems associated with the gap needed between reflectors and absorbers to reduce conductive heat losses are assessed, several types of ideal light collectors with diminished absorbers surrounded by glass tubes, with truncated reflectors to create a gap between the reflector and the receiver, or with the receiver modified to form a radiation cavity, are described. Use of a second-stage concentrator in solar or photovoltaic systems is also considered. Advantages of the two-stage systems include more uniform flux distribution and increase in the concentration factor. In addition, prescriptions for maximizing the concentration factors of lens-mirror combination concentrators are given. J. M. B.

**A77-48957** Solar process heat from concentrating flat-plate collectors. D. P. Grimmer (California, University, Los-Alamos, N. Mex.) and K. C. Herr (Aerospace Corp., El Segundo, Calif.). In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 2*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 351-374. 18 refs. ERDA-sponsored research.

The use of solar energy in the form of process heat for industrial, commercial and utility applications in the United States is discussed. Compound parabolic concentrating collectors, which achieve high collection efficiencies with minimum solar tracking, are proposed as solar energy sources, an analysis suggests that compound parabolic concentrator systems operating at temperatures of 250 C could furnish as much as 39.6% of the 1975 national Gross Energy Input (GEI). Furthermore, it appears that current technology evacuated compound parabolic concentrating collectors could supply nearly half the 1975 national GEI. Economic considerations and the design of compound parabolic concentrators for industrial applications are also considered. J. M. B.

**A77-48958** A compound parabolic concentrator array optimized for northern climates. M. L. Stein (DeBell and Richardson Testing Institute, Enfield, Conn.). In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 2*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 375-387. 6 refs.

The radiative exchange between collector and source sets the limit for efficient collector operation. When actual insolation conditions and performance requirements are considered for northern latitudes, the compound parabolic concentrator is shown to perform better than the flat plate since it approaches the limit for optimum radiative exchange. The relationship between concentration and acceptance angle is analyzed for its effect on the collector's overall thermal performance. The resulting collector is compared with an equivalent flat-plate type. (Author)

**A77-48959** Heating of buildings with solar energy. G. O. G. Lof (Colorado State University, Fort Collins, Colo.). In *Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3*. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 1-12.

The presented review on the solar heating of buildings includes a brief description of the principal types of solar heating systems, an indication of their degree of commercialization, and an evaluation of current and near-future economic factors. Attention is given to solar heating with liquid collectors and hot water storage, solar heating with air collectors and pebble-bed storage, systems with combined



collector-storage unit, systems with high efficiency utilizing special design features, and solar heating prospects and impacts. It is concluded that the solar heating industry will experience an enormous growth during the next two decades. G R

**A77-48961** Parametric study of a dynamic solar powered absorption cycle. R W Allen and D K. Anand (Maryland, University, College Park, Md.) In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 27-43 10 refs Contract No E(40-1)-4976

The performance of a solar powered absorption cycle is simulated taking into consideration the internal heat transfer characteristics and the floating of the generator/condenser/evaporator/absorber temperatures. A parametric analysis for capacity and cut-off temperatures is conducted. The daily and seasonal system coefficient of performance and capacity delivered at the evaporator is obtained with the use of real weather data. (Author)

**A77-48962** Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures. K. Dao, M Simmons, R Wolgast, and M Wahlig (California, University, Berkeley, Calif.). In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 46-52

The paper describes an experimental air-cooled ammonia-water absorption air conditioning system for the study of operational stability near the cut-off conditions, and designed to operate at temperatures compatible with the temperature range of flat-plate solar collectors. Three temperature ranges were tested, and circulation ratios were from 8 to 30. Construction procedures for the air conditioner and generator are described. It was concluded that with a heat source temperature below 200 F and a heat sink temperature (using air cooling) below 110 F, the ammonia-water absorption cycle may be used for cooling. Future applications of the project, both for cooling and heating purposes, are outlined. S.C.S

**A77-48963** Modelling of a solar-operated absorption air conditioner system with refrigerant storage. S L Grassie and N R Sheridan. In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 53-67 15 refs

A detailed dynamic model of a solar air conditioning system is reported. The model, including the solar collector and cooling tower, is described in terms of design parameters. Ambient wet and dry bulb temperatures and solar radiation are the required inputs. System temperatures, energy flows and coefficient of performance can be predicted. Careful attention is given to the evaporator model and the control of refrigerant flow. Typical performance results are discussed. Finally several recommendations for future investigations are made. (Author)

**A77-48964** Cooling subsystem design in CSU Solar House III. D S Ward, G O G Löf (Colorado State University, Fort Collins, Colo.), and T Uesaki (Yazaki Parts Co., Kosai, Shizuoka, Japan). In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 68-89

The use of cool storage in conjunction with lithium bromide absorption chillers allows for improved operating conditions of the cooling subsystem. Significant performance degradation in the absorption cooling capacity is evident whenever the chiller cycles on and off during periods of low cooling demand. The capability of providing storage for the chiller output prevents short-term cycling of the absorption machine and significantly improves the seasonal average coefficient of performance of the cooling subsystem. Cool storage can also be utilized to allow for a lower cooling capacity of the absorption unit (lower tonnage), without decreasing the ability

of the subsystem to meet the cooling demands of the building. The size of cool storage can, in fact, be optimized by evaluating the ability of the cool storage component to prevent cycling of the absorption machine and in meeting the cooling demands on a smaller tonnage chiller. (Author)

**A77-48965** Coefficient of performance for solar-powered space cooling systems. H M Curran (Hittman Associates, Inc., Columbia, Md.). In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 90-98 Contract No E(11-1)-2703

This paper proposes a common basis for defining coefficient of performance (COP) for diverse cooling systems which are wholly or partially driven by solar energy. Such a common basis would permit more meaningful comparisons between different systems. Possible energy inputs for different solar-powered cooling systems are identified and incorporated into a generalized energy balance diagram. The proposed energy balance boundary for a COP computation basis includes the solar-powered cooling machine and heat rejection equipment and excludes the solar collector/storage system and the building circulation system. The COP is defined as the ratio of the cooling load rate to the sum of all energy input rates across the boundary. The recommended approach is to compute COP with respect to a set of psychrometric conditions related to the cooling load. (Author)

**A77-48966** A solar heated and cooled office building. S Diamond, C Packard, R L San Martin, H Shaw, and W Stevens (New Mexico State University, Las Cruces, N Mex.). In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 99-105. Research supported by the New Mexico State Energy Research and Development Program and ERDA.

The solar heating and cooling system for the New Mexico Department of Agriculture building is described. The total area of the solar collectors is 6730 square feet, consisting of Sunsource flat plate collectors and Northrup concentrating collectors. A schematic drawing of the integrated solar heating and cooling systems is included along with a discussion of hot and cold water storage and the building's heating and cooling loads. The basic components of the project's computer-based instrumentation system are listed and explained, such as the interconnection of the computer and remote stations with a bi-directional digital bus, and the so-called mini-computer, the nucleus of the instrumentation system. S.C.S

**A77-48967** Comparative performance of solar heating with air and liquid systems. G O G Löf, S Karaki, and C C Smith (Colorado State University, Fort Collins, Colo.). In *Sharing the sun Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 106-117

A performance comparison between an air solar system and a liquid solar system for space heating under nearly equal conditions has been obtained. The Colorado State University Solar House I is a liquid solar system which has been in operation since August 1974. Solar House II, which stands adjacent to and has a comparable heating load to Solar House I, was equipped with an air solar system. The two solar houses were operated and monitored during most of the 1975-1976 heating season. Performance of the solar system is reported in terms of the collector efficiency, the amount of space heating load provided by solar energy, and the use of electrical energy to operate the solar equipment. General characteristics of the two types of systems are also compared. Information concerning installation, operation, and maintenance of the systems have been documented and are discussed. (Author)

**A77-48968** Experimental evaluation of a solar house heating system in Quebec. B Hamilton (McGill University, Montreal,



Canada) and R. McConnell (Hydro-Québec, Institut de Recherche, Varennes, Canada) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 120-135 12 refs

An experimental house employing a low-cost solar heating system has been built 170 km north of Montreal. The solar collector is a vertical air heater which covers the south wall of the house (37 sq m). A screen of expanded metal is located in front of the flat metal absorbing plate and a fan forces air through the collector to a storage bin filled with rocks. Air is distributed into the living space through baseboard diffusers. All supplementary heat is provided electrically. The heating system is being extensively monitored for at least one year. A 60-channel data acquisition system records data from thermocouples mounted throughout the system, from meteorological instruments, and from sensors installed in the electrical circuits. Preliminary results of performance are presented (Author)

**A77-48969** **Application of solar principles in designing a low cost system for warehouse heating** L R Mast (H A Williams and Associates, Inc., Columbus, Ohio) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3*

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 138-146 Research supported by Ruscilli Construction Co. and Distribution Centers

Adapting pre-engineered industrial building wall panels to an air type collector offers a low cost solution for low temperature warehouse heating. A prototype system was designed which utilized the existing building wall as an absorber, and added a fiberglass cover over wood furring strips. At 40 F entering fluid temperature, the panels would produce a 20 deg rise. The entire 3000 square foot solar system with fans, ducts, dampers, etc., is estimated at \$11,000 and will save 60 million Btu's annually. This would realize a 10 year pay back at current electric rates (Author)

**A77-48970** **A solar home for low income families** H Ashcroft, R Clark, and H Wade (Apache County Self-Help Housing, Springerville and Flagstaff, Ariz.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3*

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 147-152

The construction of a solar home for low-income families is presented with reference to a model site in Arizona. Cross-sectional and floorplan diagrams of the structure are included along with a discussion of the locations of solar heating components. Specific considerations of construction materials are outlined and the special truss design to carry the collector and the hot air plenum is described. The project's sensor instrumentation, and back up heat system are explained SCS

**A77-48971** **Lessons learned from Atlanta /Towns/ solar experiment** A Weinstein, R T Duncan, Jr., and W C Sherbin (Westinghouse Electric Corp., Special Systems Div., Baltimore, Md.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 153-167

A large-scale solar heating and cooling system experiment was designed and constructed for the Towns Elementary School, Atlanta, Georgia. This system involved 10,360 square feet of flat-plate collectors, 10,800 square feet of flat reflectors and a 100 ton absorption chiller. The lessons learned and the performance of the systems in the heating mode since initiation of operation is described (Author)

**A77-48973** **Solar cooling of a Florida Welcome Station - A demonstration** O G Hancock, Jr., H P Harrenstien, and G W Lowery (Florida Solar Energy Center, Cape Canaveral, Fla.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3*

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 190-199 ERDA-supported research

One of two commercial solar heating and cooling demonstration projects supported by ERDA in Florida is under construction at the Visitor Welcome Station on Interstate Highway 95 north of Jacksonville. The 3300 square-foot Welcome Station will be retrofitted with a 25-ton absorption chiller to take most of the load from the existing conventional air conditioner. Twenty seven hundred square feet of tracking, concentrating collectors using linear Fresnel lenses will be mounted on the ground away from the building. To drive the air conditioner during short sunless periods solar heated water will be stored in a 10,000 gallon tank. An anticipated 88 percent of the cooling load will be furnished by the solar system when it is completed early in 1977. Instrumentation will be included to compare performance with design conditions and to acquire solar irradiance design data for that geographical area (Author)

**A77-48974** **The Shenandoah Solar Community Center** J R Williams and J I Craig (Georgia Institute of Technology, Atlanta, Ga.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 200-212 7 refs ERDA-supported research

A solar energy system which is part of a building scheduled for completion later this year is discussed. The 5017 sq m building will incorporate 1042 sq m of flat plate solar collectors facing south at a 45 deg tilt, and 2415 sq m of highly polished aluminum reflectors facing north at a 36 deg tilt. Sixty-three modular solar collectors will be used, each 2.62 m high and 6.30 m wide. The collectors are double glazed with double-weight tempered low-iron glass, and the copper absorber plate is coated with electroplated black chrome. The hot water storage tank and the use of LiBr as an absorption chiller are described. The solar energy system is projected to provide 95% of the total annual energy required for winter heating and 64% of the total annual energy required for summer cooling M L

**A77-48975** **Solar heating for buildings in Ontario - Experience and analysis of single, multiple residential and commercial low rise buildings** R M R Higgin In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 213-227 7 refs

**A77-48976** **The Lowell Observatory experimental solar heating module** M Scanlon and H Wade In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3*

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 232-235

The construction of a solar heating module at the Lowell Observatory in Arizona is described. The space to be heated was approximately 300 square feet of floor area in the 42 in reflecting telescope building. The unit was built in two identical, separate modules, one a permanently fixed collector, and the other applicable for experimental purposes. The external structure, based on a triangle, provided the optimum cross section to house both the 6-ton total rock storage and the collector surface, consisting of an array of over 1000 aluminum soft drink cans. Differential temperature sensors and a thermostat device control a damper which determines the air flow configurations SCS

**A77-48977** **Design and construction of a residential solar heating system at Fermilab** J E O'Meara (Fermi National Accelerator Laboratory, Batavia, Ill.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 3*

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 236-245

A solar-heating apparatus has been installed for heating a small residence at Fermi National Accelerator Laboratory. This paper describes the design, fabrication, installation, and initial operating experience with this system. Unconventional features of the system include (1) 'fluorescent' glass tubes for collector cover glass, (2) a collapsible low-cost water bag for energy storage, and (3) self draining collector panels to provide freeze protection. The house has a conventional gas-fired forced-hot-air auxiliary heating system. Solar-heated water is fed to a fin coil in the return air duct. Design considerations for sizing this fin coil are discussed. (Author)

**A77-48978** A competitively-priced solar home, using concentrating collectors. J Kusianovich. In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 246-260.

This paper describes a 2880 sq ft two-level home completed in Albuquerque in July 1976. It is conventionally constructed and financed and is heated by concentrating solar collectors. These consist of movable reflectors which track the sun and focus its rays on fixed copper pipes, through which water is pumped. They automatically drain and turn away from the sun whenever the pump is off. The hot water is stored in 2-1000 gallon tanks and is delivered to the heated space by a standard hot water baseboard system. Domestic hot water is supplied from the same system. The entire operation is automatically controlled by photo cells and thermostats. The house also receives passive solar gain through south-windows and a built-in greenhouse. The design goal is for 90% solar heating. The overall cost was similar to comparable conventionally heated houses. (Author)

**A77-48979** Design and construction of solar space heating and hot water supply systems for experimental multi-family housing. M Udagawa and K.-I Kimura (Waseda University, Tokyo, Japan). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 262-276. Research sponsored by the Japan Housing Corp.

**A77-48980** Solar heating in northern New England. A O Converse (Dartmouth College, Hanover, N.H.). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 277-290. 8 refs. NSF-supported research.

The design and performance of several buildings utilizing air, liquid, and solar-heat pump systems are described. Performance measurements include collector efficiency, solar energy collected, and, in some cases, the time-of-day use of electricity. Measured efficiencies are used to compute the long-term expected economic performance. (Author)

**A77-48981** A hybrid solar-assisted heat pump system for residential applications. H T Gordon (Burt, Hill and Associates, Butler, Pa.). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 291-320.

A solar-assisted heat pump system was designed for a 2,000 sq ft single family residential dwelling in Buffalo, New York, to make use of the most readily available and broadly applicable solar and HVAC components in regions where electricity is the only available auxiliary fuel. The primary components of the solar/mechanical system include (1) seven hundred square feet single glazed, flat black coated, liquid circulating copper flat-plate solar collectors. Freeze protection is provided by drain-down, (2) two thousand gallon nonpressurized water storage in an insulated concrete storage tank with a special Hypalon Liner, (3) a water circulating, air heating coil for direct solar heating, and (4) an air-to-air split system heat pump for solar-assisted heat pump operation and supplementary

heating. Both units (evaporator and condenser) are placed within the mechanical space with a duct for air intake to the 'outside' unit. The solar system is expected to provide 70% of the annual space heating requirements, and 55% of the annual domestic water heating requirements for the home. The system payback will be under 14 years. (Author)

**A77-48982** Simulation study of solar heat pump systems. V D Karman, T L Freeman, and J W Mitchell (Wisconsin, University, Madison, Wis.). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 324-340. 13 refs. Contract No E(11-1)-2588.

The performance of several configurations of solar-augmented heat pump systems are evaluated. These systems include both air and water collection systems with either air-air, water-air, or special hybrid heat pumps which can use both stored energy and ambient air as energy sources. The performance evaluations employ factorial design to determine the effect of the parameters of each individual system. The systems are compared with each other and with conventional solar and conventional heat pump systems. Simulations are done for Madison, Wisconsin, Albuquerque, New Mexico, and Charleston, South Carolina, to investigate climatological effects on solar heat pump performance. The results are used to formulate general guidelines for designing solar-augmented heat pump systems. (Author)

**A77-48983** Solar heating and cooling in a commercial building. E E Adsett, A W Gunn (New Brunswick Electric Power Commission, Fredericton, Canada), and V M Ireton (New Brunswick, University, Fredericton, Canada). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 343-355.

The New Brunswick Electric Power Commission has designed a building to demonstrate solar energy exploitation to be built at Shediac, N.B. The building consists of 7000 square feet of office space and 5000 square feet of warehouse space. A solar energy assisted heat pump system is expected to provide approximately 45% of the total office heating requirements using 1260 square feet of collector area and 4000 Imperial Gallons of storage. The solar energy collectors are self draining. Water to air heat pumps are used, and supplementary electric resistance heaters are used in the heat pump source when energy is not available from the water storage. The system also allows air conditioning. The performance of the system is to be monitored, and the experience gained in design and operation is to be made available to the interested public. A separate system to demonstrate domestic water pre heating is also included in the project. (Author)

**A77-48984** An analysis on optimal design of solar heating and cooling system for school. P T Morimura (P T Morimura and Associates, Tokyo, Japan) and Y Ishida (Mitsubishi Heavy Industries, Ltd., Tokyo, Japan). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 356-370.

**A77-48985** Solar assisted heat pump air conditioning system. T Dean (Kansas, University, Lawrence, Kan.). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 373-377.

The paper presents the design of a solar assist to heat pumps in a year round air conditioning system. The residence in which the system is installed was intentionally designed to be energy conscious. It contains 1850 square feet over a 720 square foot basement,

attached 12' x 20' pit greenhouse, two car garage, and associated porches and storage areas. Solar heated water is used for domestic hot water preheat and for space heating when tank temperature exceeds 95 F. Otherwise, it circulates through the heat pump. A 200 foot water well provides the same function for cooling. Water storage is in a basement located 1500 gallon storage tank and externally located 1500 gallon concrete cistern. A 3.2 kw wind turbine provides additional energy. (Author)

**A77-48986** Operational analysis of a solar optimized heat pump. R. F. Kuharich (Colorado Springs, Dept. of Public Utilities, Colorado Springs, Colo.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 378-386. NSF-supported research.

In 1974, the City of Colorado Springs conducted a solar heating demonstration project. The National Science Foundation through its Research Applied to National Needs Program funded two years of research on the project. This paper will present the operational summary for those two years. During the first year of operation a direct solar heating mode was experimented with as well as an air-to-air heat pump as back up. The second year's operation saw a fluid to air heat pump replace the previous years heating system. The optimized heat pump used the second year of operation proved to be most cost effective. Both years heating systems will be described in detail. Various heat transfer fluids and storage schemes were evaluated during the testing program and their results will be given. (Author)

**A77-48987** Steady-state and transient performance limitations of the ARKLA Solar absorption cooling system. J. S. Rauch (Motorola, Inc., Phoenix, Ariz.) and B. D. Wood (Arizona State University, Tempe, Ariz.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 3. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 387-405. 10 refs.

An absorption air conditioner is described and evaluated for its applicability to solar energy systems. The theory of operation is reviewed, and the apparatus used to test the air conditioner is described. Steady-state and transient results are analyzed. An experimental map of the unit's performance over a range of operating conditions obtainable from a flat plate collector and cooling tower is determined for steady-state conditions, and the response to a transient typical of a system is presented. M. L.

**A77-48988** The solar fan - Solar induced draft air conditioning system. R. L. Reid (Cleveland State University, Cleveland, Ohio) and A. F. Bedinger (Tennessee, University, Knoxville, Tenn.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 1-7.

A description is presented of an induced ventilation system which was conceived as a system that might provide most or all of the cooling in the central and northern U.S. and in Canada for a small capital investment and with zero operating cost. In the described solar fan system, an air gap of about six inches is left between the back of the plate of the solar collector and the thermal insulation. With the water supply to the collector turned off, the temperature of the air increases above the environmental temperature level. If an exit and entrance are supplied to the space, the heated air will rise according to the principles of operation of thermosyphon type passive devices. G. R.

**A77-48989** A passive solar heated house - Design and construction. J. Cook and H. Wade (Arizona State University, Tempe, Ariz.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 8-14.

**A77-48990** A non-technical evaluation of four different concrete wall solar collector configurations. B. Anderson, D. Scully, and C. Michal (Total Environmental Action, Inc., Harrisville, N.H.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 15-22.

The design and construction are discussed of four solar houses which use concrete walls with insulating devices on the exterior as the principal solar collector. Two of these projects use 'Beadwall,' one uses a roller-shade-type device made of mylar, and the fourth has a greenhouse as a buffer zone between the concrete wall and the outdoors. Two of these houses have been through a full year of operation. The other two are just completed. (Author)

**A77-48991** Climate based solar house design - Hot and humid Charleston, S.C. D. V. Scully (Total Environmental Action, Inc., Harrisville, N.H.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 23-26.

Described in this paper is a design for a single family dwelling that can be expected to perform well as an environmental control system for hot and humid Charleston, S.C. This performance is a result of a design response to climatic factors such as wind patterns, humidity, solar angles, careful placement of windows and building mass, and the inclusion of an air-type solar heating system, with containerized water storage. (Author)

**A77-48992** Residential solar heating retrofit in the urban environment. N. Lior, J. A. Lepore, and S. Shore (Pennsylvania, University, Philadelphia, Pa.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 36-52. 8 refs. Research supported by the Pennsylvania Science and Engineering Foundation, U.S. Department of Housing and Urban Development, and University of Pennsylvania.

Residential solar heating retrofit is illustrated by the example of a Philadelphia row home. The implementation of a design philosophy emphasizing a minimal amount of retrofit, an optimal utilization of the existing structure and equipment, high system reliability and easy maintainability is described. The design concepts include a novel energy-collection-optimized method for collector spacing with allowance for some mutual shading, freeze protection by automatic drainage of collector liquid, multitank sensible heat storage in water, and the structural adaptation of the existing roofing system to accommodate and support the solar collectors. B. J.

**A77-48993** A status report on the USAFA solar energy program. J. M. Davis, M. W. Nay, Jr., R. L. Schmiesing, and W. A. Tolbert (U.S. Air Force Academy, Colorado Springs, Colo.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 53-66.

This report describes the initial performance of the first retrofit constructed solar-heated facility in the United States Air Force, the Solar Test House at the United States Air Force Academy. The project involves applying solar energy in a retrofit mode unlike the new construction applications in the private sector. This work is necessary because the Air Force's real property assets are largely fixed. Notable aspects of this project include both roof and ground mounted solar collector arrays, variable collection fluid flow rate, reinforced concrete storage tank, variable slope adjustment for the ground array, retrofit application, on-site weather monitoring capability, and a unique instrumentation and control system. These features have combined to produce a working solar energy laboratory. An extensive system data base has been developed and significant work has been accomplished with regard to developing solar system control techniques. (Author)

**A77-48994** Energy conservation through residential solar retrofit S A Mumma (Arizona State University, Tempe, Ariz ) and J Dzioba (Ohio State University, Columbus, Ohio) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla , International Solar Energy Society, 1976, p 67-91

An experimental study was undertaken to evaluate the performance of a low cost air transfer fluid, liquid storage solar water heater It was found that over 35 percent of the annual electric water heating needs could be met with solar energy Further, it was found that up to 35 percent improvement in solar energy collection could be achieved utilizing reflectors Up to 16 percent improvement in energy collection could also be obtained by reducing shading in the collector construction (Author)

**A77-48995** Solar retrofit of a home in Granton, Ontario. D E F Thompson (Saskatchewan Research Council, Saskatoon, Canada) and R K Swartman (Western Ontario, University, London, Canada) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 92-104

During the fall of 1975, a low cost solar heating system was installed on a house near Granton, Ontario The system was 'home-built' by the owner of the house at a materials cost of \$1,500 00 Tests performed in April, 1976 indicated a collector efficiency ranging from 17 8% to 45 8% with a mean of 33 9% Analyses of meteorological data and fuel consumption determined that the system would deliver 55% of the annual heating requirements in an 'average' year This is the equivalent of 3140 liters of heating oil, for a saving at present fuel costs of \$292 00 annually Some possible areas for system improvement are included (Author)

**A77-48996** Project Sunshower - San Jose State University dormitory retrofit to solar-assisted water heating D W Aitken and D K Rozell (San Jose State University, San Jose, Calif ) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 105-127 6 refs Research supported by the California State University

Project Sunshower involves the retrofit of three San Jose State University residence halls to solar-assisted hot water heating, with the aid of 3000 sq ft of solar collector surface area oriented in long arrays on the roof of each building The total project with 9000 sq ft of collectors was built with internal funding at a cost of about \$125,000 The paper discusses the location and physical circumstances, presents design criteria and philosophy, defines basic energy and design parameters, and gives mechanical and operational overviews of the project B J

**A77-48997** Solar retrofit applications for public buildings B D Wood (Arizona State University, Tempe, Ariz ) and J F Warnock, Jr (Arizona Solar Energy Research Commission, Phoenix, Ariz ). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla , International Solar Energy Society, 1976, p 128-152 8 refs Research sponsored by the Arizona Solar Energy Research Commission and Four Corners Regional Commission

Four buildings in Arizona, a gymnasium, a dormitory, a classroom/office/laboratory building (all three in Flagstaff) and an office building (in Phoenix), all state-owned, were evaluated for solar retrofit applications involving space conditioning and heating service water The basic (building, climatic, solar system and energy) parameters required for a feasibility analysis of solar retrofit applications were established Significant energy savings were found to be possible, but only at a cost benefit which is marginal The payback period for all the systems considered occurred during the second half of the service life of the equipment B J

**A77-48998** A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families R Clark, W Otwell, D Shaw, and H Wade (Northern Arizona Council of Governments, Flagstaff and Chino Valley, Ariz ) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 153-156

**A77-48999** System performance of first residential solar installation in Charlottesville, Virginia, U S A - Retrofitted indoor swimming pool W L Gottschalk and H P Austin In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 157-171 8 refs

**A77-49000** Insolation and temperature statistics and their influence on the design of solar heating systems and the electric utility interface W C Melton (Aerospace Corp , Los Angeles, Calif ) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 172-188 6 refs Research supported by the Electric Power Research Institute

**A77-49001** Simulation study of several solar heating systems with offpeak auxiliary P J Hughes, W A Beckman, and J A Duffie (Wisconsin, University, Madison, Wis ) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 189-207 9 refs Contract No E(11-1)-2588

Simulation methods have been used to study two basic types of offpeak electric auxiliary solar air heating systems those which separate the storage of auxiliary and solar energy and those which store energy in the same pebble bed. Separate-storage systems are thermally identical to conventional (non-offpeak) solar air heating systems if losses from the auxiliary storage unit are ignored, while combined-storage systems operate at higher temperatures and are simpler from a mechanical point of view Simulation studies, which focused on the effects of system configuration, collector loss coefficients, controls, storage size and collector flow rate on system performance, have shown the superiority of the separate-storage concept The combined-storage systems, however, perform nearly as well, provided that low loss coefficient collectors are used B J

**A77-49002** Solar powered absorption air-conditioning system performance using real and synthetic weather data. D K Anand and R W Allen (Maryland, University, College Park, Md ) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 208-227 9 refs Contract No E(40-1)-4976

The performance of a solar powered absorption air-conditioning system using real and synthetic weather data is obtained Both air-cooled and water-cooled systems are considered The synthetic data is derived using weather history and represented by a joint probability density matrix and at most six constants The coefficient of performance using real data and synthetic data is compared Long term predictions based on synthetic data are quite good It is concluded that the use of synthetic data allows very inexpensive simulation and yields satisfactory results for design purposes (Author)

**A77-49003** Unified simulation capability for solar heating and cooling system analysis. J E Irby and J M Nash (IBM Corp , Huntsville, Ala ) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4 Cape Canaveral, Fla , International Solar Energy Society, 1976, p 228-243 7 refs

To support current and projected government programs oriented toward demonstration of solar energy technology, IBM has developed a set of automated analysis tools for preliminary design, detailed performance prediction, and benefits analysis. This multi-level analytical capability consists of six computer programs, some representing the existing state of the art in the solar energy industry (solar energy system simulation and thermal loads prediction) and others being special purpose tools adapted and/or developed by IBM (long-term performance prediction and economic analysis). This paper describes the structure and capability of each and its role in supporting development of the solar energy industry. (Author)

**A77-49004** Performance of a solar heating system utilizing phase-change energy storage. D J Morrison and S I Abdel-Khalik (Wisconsin, University, Madison, Wis.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 244-257 11 refs Contract No E(11-1)-2588

A model describing the transient behavior of a phase-change energy storage (PCES) unit is presented. Simulation techniques are used in conjunction with this model to determine the performance of a solar air-heating system utilizing PCES. The effects of storage size and heat transfer characteristics on the system performance are investigated. Optimum ranges of storage sizes are given for systems with paraffin wax and sodium sulfate decahydrate as storage media. Comparison is made between two similar systems with sensible heat and phase-change storage. The variations of the collector efficiency and solar-supplied fraction of the load over the heating season are given for both systems. Actual weather data for the Madison area are used in these simulations. (Author)

**A77-49005** Climatological constraints on the development of solar energy in Canada. J E Hay (British Columbia, University, Vancouver, Canada) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 258-270 8 refs

This paper recognizes persistency of low radiation inputs and the out-of-phase nature of domestic heat demand and solar energy availability as two climatological constraints on the development of solar energy in Canada. Both problems can be at least partially overcome by the provision of storage and data presented for Vancouver and Winnipeg on the one hand and eight Canadian locations on the other should provide a basis for rational specification of storage requirements. Two types of persistency analyses are undertaken while the requirements for longterm storage are indicated by comparing monthly mean values of available solar energy and domestic heat demand. (Author)

**A77-49006** A design procedure for solar air heating systems. S A Klein, W A Beckman, and J A Duffie (Wisconsin, University, Madison, Wis.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 271-279 9 refs

**A77-49007** A simplified method for calculating required solar collector array size for space heating. J D Balcomb and J C Hedstrom (California, University, Los Alamos, N Mex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 280-294 ERDA-sponsored research

**A77-49008** An averaging technique for predicting the performance of a solar energy collector system. G H Stickford, Jr (Battelle Columbus Laboratories, Columbus, Ohio) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 295-315 6 refs

An averaging technique, based on an approach of Hottel and Whillier (1955), is described which simplifies the task of predicting the performance of a solar energy collector system. The long term average daily energy gain of a collector system is determined, and, by assuming that the mid-month day is representative of the entire month, only 12 calculations are required to determine the yearly performance of the system. The collector parameters required are the heat removal efficiency factor, the product of transmissivity-absorptivity evaluated at 50 deg angle of incidence, the monthly average absorber plate temperature, the latitude and collector tilt angle, and the collector area. The meteorological data required are the monthly average ambient temperature, the monthly degree-day data, the monthly atmospheric transmission factor, and the solar flux incident on the collector. The technique has been applied to the prediction of the performance of the MIT Solar House IV. B J

**A77-49010** Minimum cost sizing of solar heating systems. J C Ward (Colorado State University, Fort Collins, Colo.). In: Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 336-346 Research supported by the Economic Development Administration and Colorado State University

The characteristics of solar heating systems as they would function in 11 cities scattered across the USA were examined, and a correlation was found between the fraction of the annual heating load furnished by solar energy and a dimensionless ratio, (solar collector area times the January solar radiation)/(the January heating load of the building). A 'typical' liquid heating solar collector was used, and it was assumed that there was no heat exchanger between the solar collector and the hot water heat storage tank. Estimates of the monthly fraction of the heating load as a function of the collector characteristics and area, heating load, and local climate, were obtained from a paper by Klein, Beckman, and Duffie (1975). M.L.

**A77-49012** A structural design process for solar energy systems. V H Johnson, A J Kemp, and R B Lollar (IBM Corp., Huntsville, Ala.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 360-374

An approach to solar energy system design is described which involves detailed computer simulation and mathematical optimization constrained by practical considerations and physical subsystem characteristics. A second activity involves the nuts and bolts tasks associated with transforming the analytically optimum paper design into an installation which will perform reliably over a reasonable lifetime. The technical approach has been divided into three major elements: subsystem evaluation, cost/performance trade studies and system design. The design of a liquid hot water and space heating system for a typical residence in the Southeast United States is considered and the use of such a design process for systems in the Tennessee Valley Area is discussed. B J

**A77-49014** Site Data Collection System for solar energy applications. C K Luttrell (Teledyne Brown Engineering, Huntsville, Ala.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 4. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 384-402. Research supported by the Teledyne Brown Engineering.

A cost-effective Site Data Collection System has been developed for evaluating solar heating and cooling systems. It is adaptable to large or small acquisition tasks, can store data for extended periods, and can be set up for local removal of data via cassette tape or remote polling via telephone link, allowing immediate site monitoring. Collection of solar energy has been achieved by combining environmental transducer units with interconnection cables and data acquisition units. A microprocessor performs the system timing and

control functions. The system allows the user to plan sample rates and to select the number of channels to monitor, data retrieval methods, and conversion time on input data and data compression.

B J

**A77-49015** Microcomputer processor for monitoring of solar heated buildings. K C Forseth, I H Thomae, and A O Converse (Dartmouth College, Hanover, N H). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 403-406.

A multi-channel monitoring system, utilizing a programmable microcomputer, has been developed in which preliminary data reduction is performed by the recording instrument. Accumulated performance measures can be printed hourly or daily, or, through the use of an external data set, the instrument may be polled by telephone to retrieve the data. The parts to build the 8-channel prototype cost \$900. In lots of 100 these could presently be purchased for \$500, we therefore estimate that the monitor could be manufactured and sold for \$2500. (Author)

**A77-49016** Cost effective solar heating of houses with seasonal storage of energy. R W Besant (Saskatchewan, University, Saskatoon, Canada) and C B Winn (Colorado State University, Solar Environmental Engineering Co., Inc., Fort Collins, Colo.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 4.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 409-424. 13 refs.

A feasibility study of solar heating with seasonal storage of energy has been carried out, with consideration of such technologies as space and service hot water heating using flat plate, vacuum tube array and tracking and focusing collectors. Cost and size comparisons are made for six North American cities in a computer simulation based on the average hourly monthly output of each collector. It was found that oversizing the collector area resulted in a decreased size of storage volume for hot water, especially for high performance collectors. It is suggested that moderate sizes of solar components would be required in most parts of North America, and that costs of such systems would be competitive with present heating costs for some fuels in some locations when the cost of an auxiliary heating system and chimney are removed from present costs. B J

**A77-49017** Solar thermal system requirements. D E Anderson (Sheldahl, Inc., Northfield, Minn.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 1-8.

The collection and utilization of solar thermal energy for electrical power production, industrial process heat, and total energy systems is examined with regard to collection efficiency and system cost. Depending upon such factors as use temperature, siting requirements, back-up energy sources, and cooling requirements, a variety of collection systems may have 'best effectiveness' for given applications. Systems ranging from low temperature (around 100 C) to high temperature (around 500 C) can be all fabricated, installed, and maintained with state-of-the-art technology, wide-scale use will depend upon selecting the right system and/or the right application. (Author)

**A77-49018** Technical and economic feasibility of Ocean Thermal Energy Conversion. G L Dugger, E J Francis, and W H Avery (Johns Hopkins University, Laurel, Md.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 9-45. 46 refs. Research supported by the U.S. Maritime Administration and ERDA.

Ocean Thermal Energy Conversion (OTEC) plants will employ the temperature difference between the solar heated surface layer of

a tropical ocean (24 to 28 C) and the water at 500 to 1200 m depth (4 to 7 C) as the source and sink for a Rankine cycle system to generate electric power. The first commercial plants could be deployed in the mid-1980s, and we believe they will be competitive then with fossil fuel and nuclear energy sources for selected applications. Ammonia (for fertilizers) is a particularly attractive product, because 95% of the ammonia produced in the U.S. is now made from natural gas, our scarcest resource. Direct delivery of electric power to shore may also be competitive for, e.g., the southeastern United States. In the 1990s, delivery of liquid hydrogen and many other products should become attractive. Various OTEC plant-ship concepts, their economics, onboard production plants, and some of the environmental considerations are discussed. (Author)

**A77-49019** Survey of the applications of solar thermal energy to industrial process heat. M D Fraser (InterTechnology Corp., Warrenton, Va.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 46-57. Contract No. E(11-1)-2829.

The considered survey constitutes an initial project which is to provide data useful to ERDA to determine the scope, extent, and direction of future work related to the utilization of solar thermal energy for industrial processing applications. The first task is to obtain information concerning the use of process heat by industry in its production processes. The overall objective of the second task is to identify the characteristics of various solar thermal energy systems with regard to their ability to provide the process heat. To analyze the economics of solar thermal energy employed in industrial applications, a procedure has been developed which will be used to calculate the cost of solar energy for the different systems as a function of temperature and solar region. G R

**A77-49020** Solar energy for process heat. R Reimels (Brown and Root, Inc., Houston, Tex.) and J R Howell (Houston, University, Houston, Tex.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 58-76.

The use of solar systems to supplement process heat loads is discussed. Direct and indirect solar systems are considered, and the computer analyses of thermal performance, a storage model, and a collector model are described. Some output data are provided. The economic feasibility of solar systems is examined, with attention to industrial requirements. M L

**A77-49021** A solar/Stirling total energy system. R L Pons (Ford Aerospace and Communication Corp., Aeronutronic Div., Newport Beach, Calif.) and R J Fox (Walt Disney Productions, WED Enterprises Div., Glendale, Calif.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 77-91. 12 refs.

A conceptual design of a solar-powered Stirling engine-driven total energy system (TES) is presented. Analysis results are given for a demonstration system which would supply the total energy needs of an advanced concept multi-unit residential complex. The concept also has application to commercial buildings, schools, hospitals, and shopping centers. The system is designed to make maximum use of Stirling automotive technology under current development. Preliminary economic analysis, based on large-scale production of components, indicates an equivalent electrical cost for the proposed complex on the order of 50 mils/KWh. (Author)

**A77-49022** Conceptual design of an open cycle gas turbine solar central receiver system. E Fourakis and P D. Mitchell (Energy Resources Center, Minneapolis, Minn.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 92-98.

In the conceptual design of a high-temperature solar electric plant, two mathematical models and associated computer software have been developed and extensively used. The solar central receiver model analyzes the performance of various combinations of collector field and central receiver geometries in terms of gross power received and power flux maps on the receiver walls. The software is a Monte Carlo ray-trace. The heat exchanger and cavity analysis model evaluates the microscopic performance of the heat transfer surfaces and uses the results to evaluate the macroscopic performance of the receiver cavity as a whole. (Author)

**A77-49023** Smith multimodule solar-electric plant. O J M Smith (California, University, Berkeley, Calif.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 99-116.

A practical solar-thermal-electric power plant can be built at a reasonable cost with available materials and conventional engineering design techniques. Fields of steerable mirrors concentrate the reflected sunlight on hot receptors behind heat-conserving windows on short towers. The absorbed heat from the hot receptors is carried by heat exchange fluids through pipes to a central station power plant containing heat exchangers to preheat and boil water and to superheat steam, and a conventional turbine and electrical generator. A 100-megawatt power plant would be supplied from 1100 towers of 35 meters height, each tower receptor illuminated by a hexagonal field of 50 meters by 48 meters. Each field has 312 mirrors of 2 square meters surface each. The capital cost in dollars per megawatt-hour of annual production has been reduced by unique heliostat field geometry, mirror construction, high transmission window, high absorption cavity, and optimum utilization of available heat at different temperatures in the thermodynamic cycle. (Author)

**A77-49024** Shallow solar ponds for industrial process heat - The ERDA-Sohio project. W C Dickinson, A F Clark, and A Iantuono (California, University, Livermore, Calif.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 117-142. 7 refs. Contract No. W-7405-eng-48.

Shallow solar ponds to supply cost-competitive solar heated water for industrial use have been developed. A prototype system has been built and put into operation at the site of a new uranium mine and milling complex near Grants, New Mexico. When operational, a projected full-size system is expected to furnish approximately half of the 10 to the fifth GJ annual site process heat requirement. A description of the physical features of shallow solar ponds is presented along with a method for analyzing pond performance. An economic analysis of the projected solar system is provided. (Author)

**A77-49025** A generalized numerical model for predicting energy transfers and performance of large solar ponds. B W Davis (Northern Arizona University, Flagstaff, Ariz.), J A Day, and A Iantuono (California, University, Livermore, Calif.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 143-168. 5 refs.

A highly generalized numerical model is being developed for predicting energy transfers and performance characteristics of large solar ponds. The code will be used to optimize the design and operation of a large solar pond system which is expected to provide a large part of the 400,000 gallons of 140 F water used per day at a uranium milling facility in New Mexico. The code predicts that two inches of glass foam insulation will reduce the energy losses by more than 20% over the 'no-insulation' condition. The code provides information about the energy delivered in response to a myriad of variations in the fill/empty cycle, and also provides information on several other subjects, which are described. A brief discussion of extensions of the code is also presented. (Author)

**A77-49026** Experience with a prototype solar pond for space heating. C E Nielsen (Ohio State University, Columbus, Ohio). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 169-182. Research supported by the Ohio State University.

A solar pond of 2.5 m depth and 200 sq m area has been operated since Aug 1975. It was conceived as an economic prototype, and commercial construction cost is estimated at \$7500, heat calculated available for winter use is 50,000 kW-hr thermal. To determine performance, the distributions of temperature in pond and earth and of salinity have been recorded. Behavior of surface and internal convection layers has been studied, and methods for eliminating them have been explored. Heating of sloping black walls may be troublesome but can be eliminated by design modification. Algae growth and contamination by leaves have occurred but appear manageable. Because of the late start, no heat was extracted last winter. Minimum pond temperature under ice and snow cover was 28 C in Feb 1976, in June it reached 62 C. On the whole, performance to date is encouraging. (Author)

**A77-49027** Salt requirement and stability of solar ponds. C E Nielsen (Ohio State University, Columbus, Ohio) and A Rabi (Argonne National Laboratory, Argonne, Ill.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 183-187. 12 refs.

The cost involved in the establishment of solar-pond systems for the storage of solar energy is largely determined by the cost of the salt. The stability conditions for the solar pond are considered with the objective to minimize the salt requirements. A framework is presented for analyzing the stability of the boundary between a convective and a nonconvective layer of a solar pond. Attention is also given to approaches for preserving the required salinity gradient against diffusion. G R

**A77-49028** Solar pond stability experiments. J P. Leshuk, R J Zaworski (Oregon State University, Corvallis, Ore.), D L Styris, and O K Harling (Battelle Pacific Northwest Laboratories, Richland, Wash.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 188-202. 12 refs. Contract No. AT(45-1)-1830.

Nonconvecting salt pond solar collector/storage systems are studied with attention to the long term stability of salinity gradients. The results of a year long experimental investigation are reported with conclusions drawn from partial data reduction. Despite limitations of model systems, which are discussed, favorable observations about the stability of these thermohaline systems were obtained. A maximum bottom temperature of 76 C and stable temperature gradients ranging from 150 - 300 C/meter were detected. Slow top and bottom mixing layer growth was the only failure mode noted despite attempts to introduce instabilities at intermediate levels. It is thought that normal energy extraction and evaporation make-up methods might provide a stabilizing influence. \* M L

**A77-49029** Solar industrial steam. A F. Clark (California, University, Livermore, Calif.) and M. F. Meriam (California, University, Livermore and Berkeley, Calif.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 203-209. 6 refs. Contract No. W-7405-eng-48.

Advantages of solar heating for industrial uses are considered. Economics of scale can make industrial systems cost effective, and the larger amounts of heat collectable in the summer can be used. Since the energy content of steam is due mostly to heat of vaporization, it is recommended that a solar energy assist to process steam should try to make steam rather than just preheat hot water. A



preferred scheme for making steam involves an inexpensive low concentration reflector in the form of a cylinder of inflated plastic film, transparent on top and reflecting on the bottom, a black pipe containing water (and steam) is placed at the focal line. The produced steam can be compressed. A possible 24-hr supply system is considered, and some parameters of a possible solar steam system are indicated M L

**A77-49030 Study of a solar assisted diffusion separation process for isotopic mixtures** L E Ita (Nevada, University, Las Vegas, Nev.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 5*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 220-231 5 refs

The paper discusses the possibility of utilizing direct solar radiation to create the required temperature gradient for a planar thermal diffusion separating column. The resulting temperature difference from thermal insolation is expressed as a function of the column characteristic Biot number. The separation factor is described for (1) a single cell with no cell circulation (resulting in a low separation factor and a high yield rate), and (2) a system of cells with cell circulation (resulting in three performance indicators: the specific static mass, specific energy, and specific area). An equal stage separation model is described with regard to factors influencing the specific area, and an example of intermediate gaseous uranium h-fluoride production is presented S C S

**A77-49031 Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications** J Allen, N Levitz, A Rabl, K Reed, W. Schertz, and R Winston (Argonne National Laboratory, Argonne, Ill.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 5*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 232-241 7 refs ERDA-supported research

The design and construction of a lightweight collector panel that uses the Compound Parabolic Concentrator (CPC) to achieve maximal concentration with minimal tracking requirements is described. The primary goal of the effort has been the development of methods of constructing the units with low cost materials that still allow high temperature (120-230 C) operation. The use of thermoformed plastics for both the container box and the reflector substrate has been investigated for use in combination with an evacuated glass tube around the absorber plate. The predicted performance of the collector has been calculated, and the problem of keeping the reflectors cool has been addressed. Preliminary results on the reflector tests are presented. (Author)

**A77-49032 Solar thermal electric power systems - Comparison of line focus collectors** W S Duff and W W Shaner (Colorado State University, Fort Collins, Colo.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 5*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 244-271 15 refs

Three different line focus collectors, the parabolic trough, the circular array of fixed slats with a movable absorber, and the linear array of movable curved slats with a fixed absorber, are evaluated using minimum cost per kilowatt hour of electricity generated as the measure of performance. The minimum cost of electricity is found using a sequential optimization approach that considers variations in rim angle, reflectance, aperture width, length, orientation, tracking, contour error, slat width, slat curvature, tangent slat angle, slope, design, installation methods, materials, fabrication methods, absorptance, emittance, cover transmittance, field shape, layout, pipe sizes, insulation thicknesses and turbine-generator-cooling tower efficiencies and designs. This approach provides a uniform treatment of both cost and performance for the solar thermal electric power system. This uniform treatment of solar thermal electric power systems for all collector types insures that valid comparisons can be made. (Author)

**A77-49033 Turntable solar arrays** C J Swet (ERDA, Washington, D C.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 5*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 274-290 5 refs

A method of assembling and orienting extremely compact arrays of linear concentrators is described, in which the entire array is rotated as a unit in turntable fashion to follow the sun. The performance of such arrays is examined parametrically in terms of direct energy interception per unit area, as a function of geometry, geographic latitude, time of day, and season of year, and is shown to exceed that of arrays of individually oriented linear collectors that rotate about North-South polar axes. An adaptation based on the use of tilted Fresnel refractors is described, which enables the collection of diffuse sunlight while concentrating the direct component. The feasibility and utility of this adaptation are preliminarily assessed. Applications of turntable arrays to irrigation pumping, electric power generation, and total energy systems are depicted. (Author)

**A77-49034 \* Technical feasibility of a modular dish solar electric system** B P Gupta (Honeywell Energy Resources Center, Minneapolis, Minn.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 5*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 291-309 Contract No NAS3-19740

The paper presents the technical feasibility of generating electricity by using a gas turbine in conjunction with a paraboloid of revolution (dish) solar concentrator. A conceptual design of a dish concentrator is obtained by parametrically examining the significant optical parameters. The optical performance analysis was conducted using a Monte Carlo ray-trace simulation program. The performance of four candidate thermodynamic cycles utilizing two working fluids was analyzed, the cycles were the regenerative and nonregenerative Brayton cycles of both open and closed type. Air and helium were the working fluids for the open and closed type respectively. Heat transfer from the solar radiation to the gas flowing in metal tubes at the receiver was also analyzed. A paraboloid of revolution dish with a cavity receiver using an open air regenerative Brayton cycle turbine emerged as a technically feasible concept in the power range from 30 to 100 KWth per module. (Author)

**A77-49035 Fermi function model absorption profile for solar-thermal conversion** D E Soule, J H Schnitzmeyer, and W R McKie (Western Illinois University, Macomb, Ill.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 5*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 310-322 10 refs Research supported by the Western Illinois University and Argonne National Laboratory.

A parametrized Fermi function model is introduced to fit the spectral absorptance profiles of typical spectrally selective absorbing layers over the wavelength range from 0.3 to 40 microns. The resulting temperature dependence of spectral and thermodynamic solar-thermal conversion efficiencies for a focused concentrator system are calculated. Comparisons made between spectrally selective and blackbody absorbers over the concentration ratio range from 1X to 10,000X showed spectrally selective absorbers to be advantageous usually up to at least 100X (about 500-800 C), with the assumption that the absorbing surface is thermally durable over the required temperature range. With existing optical data, the effect of high-temperature spectral absorptance is also taken into account. The relative merits of the parametrized model versus the usual spectral absorptance/emittance ratio are discussed in the light of potential solid-state spectral absorptance profile tailoring. (Author)

**A77-49036 A central receiver solar system applicable to central power stations.** R. L. Gervais (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.), J. M. Friefeld (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.), and A. W. McKenzie (Stearns-Roger, Inc., Denver, Colo.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint*



Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5  
Cape Canaveral, Fla., International Solar Energy  
Society, 1976, p. 325-335.

This paper presents an overview of a central receiver solar thermal electric system. The design is distinct in that it utilizes (1) first-surface mirrored heliostats, (2) an external, single pass-to-superheat receiver, and (3) a sensible heat, thermocline type thermal storage. A 100-MWe commercial power plant, designed for integration into a utility network, is described. A 10-MWe pilot plant whose purpose is to establish technical feasibility and provide an indication of system economics for the commercial system is then given focus. The solar-indigenous subsystems of the 10-MWe pilot plant, i.e., the collector, receiver, and thermal storage are also addressed in some detail. (Author)

**A77-49037** Central receiver solar thermal power F A Blake (Martin Marietta Aerospace, Denver, Colo.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 336-354. Contract No E(04-3)-1110

The planning of a 10 MWe solar power plant intended as a pilot plant for a 100 MWe project is discussed. A schematic of the pilot plant is provided, and its baseline configuration with respect to the 100 MWe plant is explained. The planned development of cavity receivers is described with attention to features of a 1 MWth cavity receiver steam generator. Two planned experiments, the thermal storage subsystem research experiment and the concentrating heliostat research experiment, are described. The electric power generation subsystem is examined. A preliminary economic summary and a typical day performance profile are provided. M L

**A77-49038** Solar flux density distributions on central tower receivers M Riaz and T Gurr (Minnesota, University, Minneapolis, Minn.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 356-373. 5 refs

An analytical formulation of the solar flux density distributions produced on the surface of a central tower receiver by large mirror fields is developed. This formulation accounts for dispersion, shading, and screening effects of mirrors, and for degradation of insolation levels. The case of symmetrical geometries involving circular mirror fields and vertical cylindrical receivers is analyzed. A general method of calculation yields closed-form solutions for the concentration ratios in terms of normalized parameters describing the mirror field configuration, the receiver dimensions, the insolation levels, the mirror characteristics, and the time of the day. Aiming strategies of mirror focusing and mirror field asymmetries which induce flux gradients around the receiver are examined. The methodology can be applied to many other geometries considered for receivers in solar power tower systems. M L

**A77-49039** Collector field design for a central receiver solar thermal power plant C. R. Easton, J. E. Raetz, and L. L. Vant-Hull (McDonnell Douglas Astronautics Co., Huntington Beach, Calif., Houston, University, Houston, Tex.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 374-384.

The collector field design of a central receiver solar thermal power plant is described, and cost estimates of the system are presented. The collector subsystem consists of an array of tracking heliostats and field controllers, concentrating the sun's light to the top of a tower located within the array. Front-surface-silvered 6.34 mm float glass with an acrylic coating is used for the reflecting surface, supported against wind and gravity loads. The drive unit, incorporating an elevation/azimuth gimbal mount, and the heliostat pedestal structure are discussed. Control sensors include beam sensors for normal tracking and position potentiometers for mea-

suring the angular positions of the gimbal axes. The field controller is used as a communication link between the master control and heliostat, and provides the heliostat closed-loop control, drive-motor and control-sensor power, and fault detection. A preliminary cost evaluation for collector and receiver construction and installation is included. S.C.S.

**A77-49040** Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility. E. M. Fourakis, K. L. Curtner, and P. D. Mitchell (Honeywell Energy Resources Center, Minneapolis, Minn.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 385-391.

The working heliostat field for the ERDA 5 Megawatt Solar Thermal Test Facility was designed to meet the solar thermal power requirements for testing 4 different receiver subsystem research experiments. Requirements for the field were specified in terms of yearly solar thermal energy available from the heliostats and instantaneous power levels delivered by the heliostat field to the experiments. A ray-trace simulation model of the subsystem research experiment receivers and heliostat field was the principal tool used in this conceptual design. Field deployment, focusing strategy, number of heliostats and total mirror area required to accomplish the test objectives of the facility were established. (Author)

**A77-49041** Economic aspects of Ocean Thermal Energy Conversion F. E. Naef (Lockheed Missiles and Space Co., Inc., Washington, D.C.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 392-411. 7 refs

The results of several studies indicate that solar energy collected by the surface layers of the ocean can be converted to electricity using contemporary technology, and with design and fabrication improvements, can be made economically competitive with fossil and nuclear fueled plants. OTEC technology is reviewed and economic issues are identified and discussed. Because the plant is modular and operates in the marine environment, major components can be manufactured in existing shipyards and can be operated by established marine contractors and maritime labor. The process of large scale implementation is investigated by conceptualizing a Technology Delivery System (TDS) and examining the impact of various design features and government incentives. (Author)

**A77-49042** Preliminary research on Ocean Energy Industrial Complexes. C. D. Hornburg, B. Lindal, and N. El-Ramly (DSS Engineers, Inc., Ft. Lauderdale, Fla.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 5.  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 412-435. ERDA-supported research.

Results of a one year study on the feasibility of producing energy intensive products at ocean sites using electricity generated from Ocean Thermal Energy Conversion (OTEC) plants are presented. Analysis of production methods and other data on 62 major products lead to selecting 23 of these for further study. Production was grouped into five separate, possible complexes. Further market and transportation studies showed that production of products in a sea chemicals complex and an organic chemicals and plastics complex had the highest economic potential. Detailed designs of these two complexes are presented. The three potential sites were selected for these OEICs. An environmental assessment revealed that these complexes would have no adverse environmental impact. The selected products can be produced at ocean sites competitively with production at similar land-based complexes. Return on investment will be between 13% and 18% depending on actual power costs and details of the final designs. (Author)

**A77-49044** Studies of biofouling in ocean thermal energy conversion plants. J. G. Fetkovich, G. N. Grannemann, D. L. Meier, and F. C. Munchmeyer (Carnegie-Mellon University, Pittsburgh, Pa.,

Hawaii, University, Honolulu, Hawaii) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 5.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 446-460 NSF-ERDA-supported research

**A77-49046** Design of low-cost aluminum heat exchangers for OTEC plant-ships. H. L. Olsen, P. P. Pandolfini, R. W. Blevins, G. L. Dugger, and W. H. Avery (Johns Hopkins University, Laurel, Md.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 485-506 24 refs ERDA-supported research

Successful commercial implementation of ocean thermal energy conversion (OTEC) plant-ships will require a capital cost competitive with land-based plants. The most expensive components of an OTEC system are the evaporators (heated by warm surface water), the condensers (cooled by water from 700-1000 m depth), and the floating ocean platform. To minimize these costs, simple two-phase-flow heat exchangers made of large-diameter aluminum tubes (ammonia inside, sea water outside) have been designed for integration in a simple barge-type reinforced concrete hull. Each 2.5-MWe (net) evaporator or condenser module has 132 tubes approximately 700 ft long, folded to 27 horizontal passes each, 6 of these tubes are 'nested' in a vertical plane in each of 22 'elements'. The estimated costs for the heat exchangers are reported. (Author)

**A77-49047** Sensitivity analysis for OTEC propane and mixture cycles. C. A. Lawson, K. Z. Iqbal, L. W. Fish, and K. E. Starling (Oklahoma, University, Norman, Okla.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 5.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 507-521 Contract No. E(40 1)-4944

The results of sensitivity analysis calculations are presented for OTEC (Ocean Thermal Energy Conversion) cycles using propane and propane - n-butane mixtures as working fluids. Parameter studies in the sensitivity analysis include heat exchanger LMTD's (log mean temperature differences), sea water velocities in heat exchanger tubes, warm sea water temperature rise and cold sea water temperature drop in the heat exchangers, and the cold sea water pipe length. In addition, mixture composition (mole fraction n-butane) for the propane - n-butane system was treated as a parameter. These calculations show that with present state of the art heat exchanger technology there are virtually no economic tradeoffs because of the dominant costs of the heat exchangers. It was observed that because mixtures offer an increased economic advantage over pure working fluids as the temperature rise of the cold sea water is increased, mixtures as working fluids should become more attractive as heat exchanger costs are reduced. (Author)

**A77-49048** Gulf Stream OTEC resource potential and environmental impact assessment overview. H. P. Harrenstien and W. R. McCluney (Florida Solar Energy Center, Cape Canaveral, Fla.). In Sharing the sun Solar technology in the seventies; Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 522-534, 6 refs.

The basic features of the Ocean Thermal Energy Conversion (OTEC) project are described with regard to environmental impact and the potential of Gulf Stream resources for the construction of an OTEC plant. Categories of environmental considerations are outlined for both the plant itself and the related land-based construction and support facilities with the alteration of the near-surface portion of the thermocline identified as the most significant problem. Climatological effects of a depressed sea surface temperature is discussed in terms of both regional and global effects. The Gulf Stream resources are presented along with a basic analytical model and related calculations. S. C. S.

**A77-49049** A comparison of the economics of nuclear and solar power. C. Zener (Carnegie-Mellon University, Pittsburgh, Pa.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 5. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 535-548 5 refs.

This paper compares the estimated capital costs per net power capacity for nuclear and for ocean thermal energy conversion (OTEC) plants ordered today for delivery in the mid-1980s. The estimate for nuclear plants takes into consideration the 24% annual increase in estimated costs since 1967, the historical factor of two of the actual cost over the estimated cost, and the low 56% average capacity factor for large nuclear plants, versus the planned for capacity factor of 80%. The estimate for OTEC plants starts from estimates made by industry using only state-of-the-art components and introducing anticipated improvements in the performance of heat-exchangers. The estimates obtained in this manner give about \$3000/kW for nuclear and approximately \$1000/kW for OTEC generating capacity with 80% capacity factor. (Author)

**A77-49050** Solar cells for terrestrial applications. H. J. Hovel (IBM Corp., Yorktown Heights, N.Y.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 6.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 1-21 87 refs.

The four main types of solar cells are described in detail, including silicon, cadmium sulfide-copper sulfide, concentrator and thin film cells. Energy band diagrams are presented for some of the cells and attention is given to energy conversion efficiencies. The emphasis is placed on terrestrial rather than space applications. B. J.

**A77-49051** EFG growth of silicon ribbon for solar cells. K. V. Ravi and A. I. Mlavsky (Mobil Tyco Solar Energy Corp., Waltham, Mass.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 23-33 14 refs.

The paper reviews the status of the edge-defined, film-fed growth (EFG) process for producing ribbon-shaped crystals of silicon for solar cell applications. Attention is given to equipment, cost and ribbon-quality considerations along with crystal growth characteristics. Solar cells in two sizes have been fabricated from the silicon ribbons: 1 cm x 2 cm and 1 in x 4 in. Cell efficiencies are in the 7-12% (AM1) range, with the larger area cells exhibiting the lower efficiencies. B. J.

**A77-49052 \*** Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion. J. A. Zoutendyk (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 6.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 34-47 22 refs.

Because of the growing need for new sources of electrical energy, photovoltaic solar energy conversion is being developed. Photovoltaic devices are now being produced mainly from silicon wafers obtained from the slicing and polishing of cylindrically shaped single crystal ingots. Inherently high-cost processes now being used must either be eliminated or modified to provide low-cost crystalline silicon. Basic to this pursuit is the development of new or modified methods of crystal growth and, if necessary, crystal cutting. If silicon could be grown in a form requiring no cutting, a significant cost saving would potentially be realized. Therefore, several techniques for growth in the form of ribbons or sheets are being explored. In addition, novel techniques for low-cost ingot growth and cutting are under investigation. (Author)

**A77-49053 \*** Design considerations of solar arrays for terrestrial applications. R. G. Ross, Jr. (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) In Sharing the

sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6  
Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 48-56 ERDA-sponsored research, Contract No NAS7-100

The primary objective of the Low-cost Silicon Solar Array (LSSA) Project, which forms a major part of a national photovoltaic program, is the timely development of low-cost commercial-quality photovoltaic arrays through an active program of industrial and academic involvement. The definition of future array requirements is considered as a necessary step toward meeting this objective. An overview of array requirement trends which begin to evolve from the various ERDA activities is presented. For present terrestrial arrays the primary requirement is to generate power for small, often remote electric-power applications. To meet an objective of increased energy independence requires that photovoltaics become economically viable for the large energy consumption of the future. Various developments needed to achieve such an economic viability are discussed  
G R.

**A77-49054 \*** Large area Czochralski silicon for solar cells. S. N. Rea and G. F. Wakefield (Texas Instruments, Inc., Dallas, Tex.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 57-66. 6 refs. NASA-ERDA-supported research

A detailed model of a typical Czochralski silicon crystal puller is utilized to predict maximum crystal growth rate as a function of various furnace parameters. Results of this analysis, when combined with multiblade slurry sawing, indicate that the Czochralski process is highly attractive for achieving near-term cost reduction of solar cell silicon.  
(Author)

**A77-49055 \*** Low energy production processes in manufacturing of silicon solar cells. A. R. Kirkpatrick (Simulation Physics, Inc., Burlington, Mass.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 67-72. Contracts No. NAS7-100; No. JPL-954289, No. F33615-75-C-2006.

Ion implantation and pulsed energy techniques are being combined for fabrication of silicon solar cells totally under vacuum and at room temperature. Simplified sequences allow very short processing times with small process energy consumption. Economic projections for fully automated production are excellent.  
(Author)

**A77-49056** Status of the ERDA photovoltaic materials and device studies. D. M. Warschauer (ERDA, Washington, D.C.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 73-78.

A number of techniques and systems concepts currently under investigation could, when successfully developed, make it possible to reach a cost of 50 cents or lower a peak watt by 1986. A description is presented of studies related to the long-term goal of 10 to 30 cents per peak watt by the turn of the century if not before. The studies involve an evaluation of the possibilities presented by an employment of novel materials and devices. Attention is given to the investigation of heterostructure configurations on single crystal silicon, the characteristics of silicon, gallium arsenide, cadmium sulfide-cuprous sulfide, indium phosphide, cadmium indium selenide, cadmium telluride, cuprous oxide, thin polycrystalline films of silicon and gallium arsenide on a low-cost substrate, and solar device lifetime considerations  
G R.

**A77-49057** Extension of the Hottel-Whillier-Bliss model to the analysis of combined photovoltaic/thermal flat plate collectors. L. W. Florschuetz (Arizona State University, Tempe, Ariz.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 79-92. 9 refs. Contract No. E(11-1)-2748

**A77-49058** Terrestrial concentrating photovoltaic power system studies. D. L. Evans and L. W. Florschuetz (Arizona State University, Tempe, Ariz.). In: Sharing the sun: Solar technology in the seventies; Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 93-105. 6 refs. Contract No. E(11-1)-2590.

Studies aimed at defining the role of sunlight concentration in reducing the cost of electrical energy generated by terrestrial photovoltaic systems are described. These studies use computer modeling to (a) compare silicon cells and gallium arsenide cells in concentrating systems, (b) investigate the operation of photovoltaic systems in low insolation locations and (c) evaluate the effect of wind dependent thermal conductances on performance of passively cooled systems. Optimum fixed energy costs occur at higher aperture to cell area ratios for GaAs systems compared to silicon systems due to the better high temperature performance and increased costs of GaAs. Results based on currently available data show that concentrating systems should not be ruled out relative to fixed flat unconcentrated arrays even for low solar irradiation locations such as Cleveland. The wind dependent thermal conductance studies show that for precise modeling the effect of wind speed should be considered in locations having larger wind speed deviations from the yearly mean. However, with the present uncertainties in cost inputs, the use of average values is quite appropriate.  
(Author)

**A77-49059** CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications. J. D. Meakin, B. Baron, K. W. Boer, L. Burton, W. Devaney, H. Hadley, Jr., J. Phillips, A. Rothwarf, G. Storti, and W. Tseng (Delaware University, Newark, Del.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 113-119. 13 refs. NSF Grant No. AER-72-03478.

The conversion efficiency of cadmium sulfide solar cells has shown progressive improvement and now exceeds 7-1/2%. The structure and operation of the cell is now sufficiently well understood that cells can be produced reliably and the potential for further improvement in efficiency assessed. Improved gridding procedures allow adjustment of the copper sulfide stoichiometry to give maximum short circuit current without loss in fill factor or open circuit voltage. The achievable efficiency of the CdS/Cu<sub>2</sub>S cell is assessed and the potential for further improvement by utilization of mixed zinc cadmium sulfides presented.  
(Author)

**A77-49060 \*** Basic mechanisms governing solar-cell efficiency. F. A. Lindholm, A. Neugroschel (Florida University, Gainesville, Fla.), and C. T. Sah (Illinois University, Urbana, Ill.). In Sharing the sun: Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 120-129. 26 refs. Grant No. NSG-3018, Contract No. E(40-1)-5134.

The efficiency of a solar cell depends on the material parameters appearing in the set of differential equations that describe the transport, recombination, and generation of electrons and holes. This paper describes the many basic mechanisms occurring in semiconductors that can control these material parameters.  
(Author)

**A77-49062** CuInSe<sub>2</sub>/CdS thin film solar cells. L. L. Kazmerski (Maine University, Orono, Me.). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 150-158. 11 refs. NSF-supported research.

The fabrication and characterization of several thin film p-CuInSe<sub>2</sub>/n-CdS heterojunction solar cells are presented. Two

modes of operation, involving illumination either through the  $\text{CuInSe}_2$  or the  $\text{CdS}$  layer, are discussed. Efficiencies in the range 4-5% are reported and the spectral response characteristics are presented for these heterojunctions. The forward J-V characteristics indicate the domination of the generation-recombination mechanism. Device parameters ( $V_{\text{sub OC}}$ ,  $I_{\text{sub SC}}$ , FF and eta) are summarized (Author)

**A77-49063** The Alcoa 655 selective surface for aluminum. J H Powers, A G Craig, Jr, and W King (Alcoa Technical Center, Alcoa Center, Pa.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 166-186. 23 refs.

A selective surface (a coating composed almost entirely of aluminum and oxygen) has been developed for use on aluminum solar collector absorber surfaces, which offers a cost effective solution to the problem of reducing thermal losses and increasing the efficiency of collection. The advantages of the selective surface, designated the Alcoa 655 Process, are good stability, low cost, and availability on full-size collectors. Coating properties, cost and availability are reviewed and results of absorptivity, emissivity, weather-ometer, and fade-o-meter tests are presented. B J

**A77-49064** Analytical and experimental treatment of a spray-on selective coating - Application to collector design. C S Moore, T S Ashley, III, and H A Blum (Southern Methodist University, Dallas, Tex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 187-204. 7 refs. Research supported by the Dallas Power and Light Co.

The paper describes a spray-on selective coating, utilizing a commercially available paint (the major pigment being black iron oxide) for solar collector surfaces, that has been applied to plain steel, galvanized steel and aluminum substrates. The absorptivity/emissivity curve obtained by experiment suggests the existence of an optimal absorptivity/emissivity set which would maximize the useful energy from a collector. A method developed by Tabor (1967) for optimizing selective coatings for any specified set of operating conditions (collection temperature, average insolation, etc.) is described. B J

**A77-49065** Solar energy utilization, solid state science, and a high efficiency amorphous-silicon absorber. R W Griffith (Argonne National Laboratory, Argonne, Ill.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 205-215. 20 refs. ERDA-supported research.

The electronic properties of non crystalline, i.e., amorphous, silicon (a-Si) have interesting consequences for solar energy utilization. Of particular interest is the enhanced optical absorption coefficient  $\alpha_{\text{sub } \lambda}$  in thin films of a-Si. Depending upon film preparation and operating conditions, such  $\alpha_{\text{sub } \lambda}$  profiles offer the following advantages relative to crystal-Si films. These are: (1) a 'tunable' position of the absorption edge that allows red shifts to nearly  $\lambda_{\text{sub } g}$  equals 2.1 microns and (2) a steep profile shape that can rapidly attain  $\alpha_{\text{sub } \lambda}$  of about 10 to the 5th to 10 to the 6th/cm near the center of the AM2 solar spectrum. In solar thermal conversion, a principal potential application is that of a high-efficiency thin-film selective absorber coating. In photovoltaic conversion, application can be made to super-shallow a-Si junctions as recently reported by several groups in the literature. (Author)

**A77-49066** The financial incentives for the fabrication of improved absorption coatings for the flat plate collector. F de Winter (Atlas Corp., Santa Clara, Calif.) and L D Fitzgerald (International Copper Research Association, Inc., New York, N.Y.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976.

Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 216-239. 27 refs.

**A77 49067 \*** Considerations in the development of a high performance per unit cost solar collector. W H Sims (Chamberlain Manufacturing Corp., Waterloo, Iowa.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6.

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 240-254. Contract No. NAS8-31326.

A flat plate collector employing a mild steel, pressure expanded absorber plate has been developed. It is capable of energy output levels commensurate with the requirements of driving an absorption refrigeration system while operating at efficiency levels in the 35-40% range. Selective absorber surfaces of black chrome over nickel and black copper over copper were analyzed and prototype collectors containing each type of absorber plating were fabricated and tested for performance. Criteria applied to the cost effectiveness analysis of the collector included both the energy output per unit area and the collector fabrication cost per unit area. B J

**A77-49068** Application of aluminum alloys for solar heating and cooling systems. R A Bonewitz, W King, and A G Craig, Jr (Alcoa Technical Center, Alcoa Center, Pa.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 255-273. 6 refs.

Aluminum alloys are an excellent material of construction for solar collectors because of their low weight, good strength and formability, low cost and natural resistance to atmospheric corrosion. Consideration must be given in thermal fluid selection to avoid general or pitting corrosion and in system design to avoid galvanic, crevice or erosion corrosion. In closed systems, aluminum alloys have been employed in multimetallic heating and cooling systems charged with untreated deionized or distilled water, and where they have been shown to be non-aggressive to aluminum, with some untreated natural waters. The use of suitable corrosion inhibitors is recommended for long service life. In open systems treatment is required because of concentration of the water and oxygen ingress. Ten year service experience with aluminum automobile radiators indicates that aluminum can be employed with inhibited ethylene glycol solutions with reasonable attention to the solution chemistry. (Author)

**A77-49069** Use of getters in evacuated solar collectors. W S Carter and J H H King (King Laboratories, Inc., Syracuse, N.Y.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 274-288. 16 refs.

The use of a getter in evacuated solar collectors is discussed. Heat conduction through an annulus has been found for gases at low pressures and at a range of possible operating temperatures. The pressure necessary to reduce conduction heat loss to a small value is 0.004 torr for a 2 inch O.D. glass envelope. Barium metal is useful in maintaining a vacuum of less than 0.004 torr. The gettering capacity of barium by gas specie is explained. The amount of barium necessary to properly maintain a vacuum for a 10 to 20 year collector life is discussed. Activation of the getter by induction heating is discussed. Typical performances of the getter regarding barium yield and begin of flash are illustrated. (Author)

**A77-49070** The weatherability of solar energy utilization materials - Preliminary discussions. J E Gilligan and J Brzuskiwicz (IIT Research Institute, Chicago, Ill.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 6. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 289-302. Contract No. E(11-1)-578-PA-34.

## A77-49071

**A77-49071** *Prisms with total internal reflection as solar reflectors* A Rabl (Argonne National Laboratory, Argonne, Ill ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 303-315. 10 refs ERDA-supported research

In certain solar collectors, conventional mirrors can be replaced by an array of small rectangular glass prisms with total internal reflection (TIR) The suitability of TIR prismatic reflectors for solar energy collection is investigated systematically, and the following applications are found to be promising (1) heliostats for central receiver, (2) parabolic reflectors with point focus, (3) line focus systems (both parabolic and Fresnel reflectors) tracking around north-south axis, provided the tilt of the system is adjusted seasonally, (4) under some conditions, V- and Compound Parabolic Concentrators, in trough or cone geometry Reflection at the front surface of a prism will split any incident ray into separate rays which may leave the prism in two different directions However, in all the designs considered here, all these rays will reach the absorber, and thus the effective reflectivity is indeed 100% apart from absorption losses (Author)

**A77-49072** *Reflection coefficient for a back-surface glass mirror* T Kent (Pennsylvania State University, University Park, Pa ) and L L Vant-Hull (Houston, University, Houston, Tex ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 316-324 11 refs NSF Grant No GI-39456

The variation of the reflectivity of a back-surface glass mirror with respect to the angle of incidence was studied with consideration of multiple reflections, polarization, spectral characteristics of the absorptivity and reflectivity, and thickness and absorptivity of the glass In most cases of interest, the reflectivity varies only a few percent for angles of incidence between plus and minus 80 deg and goes to unity at grazing incidence (90 deg) A 6 mm thick float glass mirror with a back-surface silver coating was used in these experiments Data for wavelength dependencies are presented, and a theoretical analysis of the optics of the system is provided Many systems, the solar tower in particular, use back-silvered mirrors to reflect the solar energy to a collector M L

**A77-49073** *On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices* N B Goodman, L Wharton, R Winston (Chicago, University, Chicago, Ill ), and R Ignatius (M7 International, Arlington Heights, Ill ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 325-330 Research supported by the University of Chicago

Prototype solid dielectric compound parabolic concentrators have been made and tested By means of the geometry and refractive properties of a transparent solid they provide a technique for increasing the power output of silicon solar cells exposed to the sun by an amount equal to the increase in effective collecting area The response is uniform over a large angle which eliminates the necessity of diurnal tracking of the sun The technique can be applied to the construction of thin panels and has the potential for significantly reducing their cost per unit area (Author)

**A77-49075** *Heat mirror - A practical alternative to the selective absorber* R M Winegarner (Optical Coating Laboratory, Inc., Santa Rosa, Calif ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 6* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 339-348

Experimental data has been found to agree with calculations showing that a heat mirror coating, used in a two cover flat plate collector can be nearly as effective as a selective absorber coating In contrast to the selective absorber coating, which is applied to the absorber plate, the heat mirror coating is applied to the inner cover

glass This feature allows one to upgrade the performance of a flat black, two cover glass collector by the replacement of an uncoated inner cover with a coated one This retrofit will provide an absolute instantaneous efficiency increase of up to 10% and a relative daily performance increase of up to 20% (Author)

**A77-49076** *Fuels and chemicals from the sun through bioconversion* R H Bogan (Washington, University, Seattle, Wash ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 2-6

Bioconversion solar energy technology promises to provide the basis for major renewable fuel supplies in the future Utilizing plant biomass materials as an energy feedstock, this technology is expected to supply the US with up to 15 Quads of energy in the form of fuels and industrial chemicals by the year 2020 Comparable global supplies appear feasible Agricultural and forest residues are the most promising near-term energy resources Terrestrial and marine energy farming systems are expected to become the dominant sources of biomass energy feedstocks after the year 2000 (Author)

**A77-49077** *Improved, inexpensive solar collectors for agricultural requirements* J H Schlag, D C Ray, A P Sheppard, and J M Wood (Georgia Institute of Technology, Atlanta, Ga ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 22-32 Research sponsored by the Georgia Institute of Genetics, US Department of Agriculture Contract No 12 14-7001-566

This article compares four different types of low-cost agricultural solar collectors which can be used for crop drying, greenhouse heating, and heating animal shelters The types of collectors to be studied are a black film, hot air collector system, a rock absorption and storage collector system, a solar pond connector system, and a greenhouse collector system Selection criteria for the materials used in the collectors and problems encountered in the actual fabrication of the collectors will also be presented A study of the instrumentation and data acquisition system used to collect the solar systems performance data is presented A digital recording system forms the nucleus of this system A time multiplex scanner has been developed which can handle as many as sixty thermocouples monitoring various collector system points The measurements which are discussed are temperature, humidity, flow rates, insolation, wind speed, and wind direction (Author)

**A77-49078** *Design and performance of an air collector for industrial crop dehydration* P W Niles, E J Carnegie, J G Pohl, and J M Chern (California Polytechnic State University, San Luis Obispo, TRW, Inc., Systems and Energy Div., Redondo Beach, Calif ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 88-99 7 refs NSF Grant No ERT-74-19063

Test results are reported for the operation of unglazed and single-glazed solar collectors used to heat air to the 200 F range The collectors were constructed of standard black-painted metal decking and were tested in various lengths so that pressure drops and convective heat transfer rates could be varied independent of collector operation temperature It is shown that the experimental collector performance results with single pass operation are in substantial agreement with standard collector analysis procedures These results give a firm basis for collector and system optimization with respect to life cycle costs (Author)

**A77-49079** *Silviculture energy plantations* R E Inman (Mitre Corp., McLean, Va ) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 100-103

A systems study of silviculture plantations to produce energy/chemical feedstock is underway. An analysis of biomass production costs is being performed for ten sites in the United States. Production scenarios will be combined with various biomass conversion scenarios to estimate final product costs. Final results will be reported in February, 1977. (Author)

**A77-49080** Field crops as a future source of fuels and chemical feedstocks. E. S. Lipinsky (Battelle Columbus Laboratories, Columbus, Ohio). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 104-117. 5 refs. ERDA-supported research.

Such field crops as sugarcane, sorghums, sugar beets, wheat, and corn are under investigation as sources of fuels and commodity chemicals. Ethanol and methanol appear more attractive for industrial use than for fuel usage. Thermochemical production of fertilizer ammonia appears especially attractive. Genetic optimization, agronomic improvements, whole-plant harvesting, and hauling cost reductions may all be needed to fulfill the economic promise of this approach to ameliorating the hydrocarbon crisis. (Author)

**A77-49081** Methane production through bioconversion of agricultural residues. D. D. Schulte, E. J. Kroecker, A. B. Sparling, and H. M. Lapp (Manitoba, University, Winnipeg, Canada). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 119-128. 26 refs. Research supported by the Biomass Energy Institute, University of Manitoba, Agricultural Institute of Canada, and Shell Canada.

Bioconversion of agricultural residues to methane gas has been restricted in the past by lack of understanding of process performance at the high organic loading rates and high organic solids concentrations normally associated with animal manures and crop residues. Experiments at the University of Manitoba carried out at organic loading rates several times that normally associated with sewage sludge digestion and at ammonia concentrations far above that formerly thought to be toxic to methane producing bacteria have shown extreme process stability. These and other results indicate that there may be a useful role for anaerobic digestion in the formulation of practical and economic farm-scale bioconversion units. (Author)

**A77-49082** A feasibility study of bio-gas production in individual farms in Southwestern Ontario. C. M. Ostrovski, N. Peters, and J. L. Sullivan (Western Ontario, University, London, Canada). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 129-145. 12 refs.

A mathematical model has been developed to examine the economic feasibility of building small digesters for single-farm utilization (on a scale of about 200 acres) to produce energy (methane gas) and fertilizer from renewable resources (crop residue and animal waste). The model considers (1) the volume of the gas needed, (2) the quantity of heat needed to operate the digester, (3) the volume and cost of a digester to produce enough heat for purposes 1 and 2, (4) the amounts of residue required and fertilizer produced, and (5) a comparison of the cost of building and operating the digester and the benefits achieved. The MOSES computer program for solving the model is presented. Some case studies relating to farms in Southwestern Ontario are discussed. B. J.

**A77-49083** Agricultural and forestry wastes as an energy resource. J. A. Alich, Jr. and J. G. Witwer (Stanford Research Institute, Menlo Park, Calif.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 146-156.

The feasibility of converting agricultural and forestry residues to energy is evaluated based on a county-by-county inventory for the conterminous United States. The impact of this energy resource on the U.S. energy system is forecast using the SRI energy model.

(Author)

**A77-49084** Perpetually renewable biomass prospects - A comparison of U.S. and Canadian ecosystem carrying capacities vs needs. E. E. Robertson (Biomass Energy Institute, Inc., Winnipeg, Canada). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 157-179. 10 refs.

This paper will delineate the solar, climatic and other perpetually renewable ecosystem prerequisites for biomass formation. It will then attempt to quantify the geographical areas in both countries which already satisfy the foregoing prerequisites. It will focus attention upon awesome programs which may become necessary to preserve and expand North America's ecosystem's capacity to perpetually provide our essential biomass - not only for energy but for food, fiber, chemical feedstocks, fertilizers and pharmaceuticals.

(Author)

**A77-49085** Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario. R. M. R. Higin and C. K. Brown (Ontario Ministry of Energy, Toronto, Ontario Research Foundation, Mississauga, Canada). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 180-194. 5 refs.

**A77-49086** Some legal-institutional implications of offshore wind energy conversion systems. L. H. Mayo (George Washington University, Washington, D.C.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 195-214. 28 refs.

Wind energy conversion systems (WECS) are being given systematic attention in the U.S. although the effort to date is still in a relatively preliminary stage. Studies underway or proposed are expected to provide needed data concerning technological practicability, economic competitiveness, and socio-political acceptability of wind energy systems. Some attention is being given specifically to offshore WECS configurations. Offshore WECS present unique problems, particularly of a legal-institutional nature, including potentially conflicting National-International and Federal-State jurisdictional claims, competing sea area uses, land use management, utility policy and regulation, and incentives to utilize innovative energy technologies. The existing array of Federal energy statutes appears to provide an adequate legal framework for vigorous research, development and demonstration programs. But it may become advisable to enact specific legislation to eliminate or ameliorate certain constraints on the implementation of offshore WECS if significant private sector participation is to be encouraged.

(Author)

**A77-49087** Wind-electric conversion utilizing field modulated generator systems. R. Ramakumar (Oklahoma State University, Stillwater, Okla.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 7. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 215-229. 24 refs. ERDA-supported research, NSF Grant No. AER-75-00647.

Variable-speed constant-frequency wind-electric systems operate at a constant tip speed ratio with varying wind speeds and enable the extraction of a part of the energy spilled by constant-speed constant-frequency systems. This paper describes the variable-speed constant-frequency wind-driven field modulated generator system under development at Oklahoma State University, sponsored by ERDA/NSF. Proposed control schemes and the experimental re-

search program underway are briefly discussed. These systems appear to be most attractive in the 'small' (10 to 50 kW) and '100 kW scale' (50 to 250 kW) sizes and for use in large capacity 'multirotor on one tower' concepts (Author)

**A77-49088 Synchronous inversion - Concept and application** H Meyer In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 230-242

Synchronous inversion involves the use of intermittent and/or variable power sources (wind, solar electric, solar thermal, hydro, tidal, wave, ocean thermal, industrial waste heat, etc.) to supplement a primary power source (anything from a 10 kilowatt diesel/generator set to a coast to coast utility grid). The requirements of the primary power source are that it be of greater capacity and lower impedance, so that it has the ability to dictate voltage and frequency and that it be present any time the alternate power source is in use. Synchronous inversion uses an ac power network as a 'storage' medium for any form of energy that can be converted to dc power, and at the same time takes advantage of the ac power source to establish both the voltage and frequency of the converted power. This paper examines synchronous inversion from the points of view of the theory of operation, metering, system design and interfacing. B J

**A77-49089 Energy content of winds in the high plains region of southwestern U.S.** O D Sittler (Eastern New Mexico University, Portales, N Mex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976, Volume 7 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 243-252

Winds at Portales, New Mexico are being studied to assess the amount of wind energy available and its distribution in time. The analysis includes the effect of short-term variations in wind speed, or gusts, in the calculation of total energy content. Data collected between November, 1975 and April, 1976 indicate that average wind speed exceeds 4.5 m/sec for 9.6 hrs/day on the average. During these hours, the average energy flux per day is about 2.2 kwhr per square meter. Sequences of 4 or 5 days having energy flux less than 1.0 kwhr per square meter seldom occur, thus, wind could supply energy in this region on a regular basis with the help of energy storage or through procedures which match energy demand to times when wind energy is available (Author)

**A77-49090 The use of built form to enhance the output of wind collectors** D R Coonley (Design-Research-Consulting, Harrisville, N.H.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 253-267 14 refs

Buildings often give rise to extreme wind velocities at ground level, especially when there is an open area for the wind to pass through. This paper considers the possibility of utilizing the wind ducting capabilities of built structures in an attempt to gain better use of and increased energy output from wind energy conversion systems. Attention is given to the integration of wind collector systems with buildings. The variation of fixed wind collector output with variation in wind direction is studied and methods for reducing wind problems around buildings are examined. B J

**A77-49091 Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions.** C G Justus (Georgia Institute of Technology, Atlanta, Ga.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 268-288 NSF Grant No GAER-75-00647, Contract No E(40-1)-5108

The performance characteristics have been simulated for large dispersed arrays of 500 kW-1500 kW wind turbines producing power and feeding it directly into the New England or Central U.S. utility

distribution grids. These studies show that in good wind environments the 500 kW generators can average (on an annual basis) up to 240 kW mean power output, and the 1500 kW generators can average up to 350 kW mean power output. Better performance (averaging up to 470 kW) is obtained, however, by an 1125 kW rated power unit designed to operate at lower wind speeds. The beneficial effect of operating large dispersed arrays of wind turbines is that available power output can be increased - if winds are not blowing over one part of the array, chances are they will over some other part of the array. These studies indicate that wind power availability levels of 200 kW per 1125 kW generator were 77% to 93%, depending on season. Reasonably steady high wind power in winter and high afternoon peak wind power in summer (corresponding to peak air conditioning load) means that significant peak load dispersion can be achieved without use of storage (Author)

**A77-49092 The application of wind power systems to the Minnesota Power and Light Company** F S Malver (Honeywell, Inc., Minneapolis, Minn.) and L D Overom (Minnesota Power and Light Co., Duluth, Minn.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 289-303 6 refs Contract No E(11-1)-2618

A Honeywell study was conducted to assess current Wind Energy Conversion System (WECS) viability for a utility application and to define the attributes and performance requirements of a system capable of yielding a satisfactory return on investment to a utility company. Minnesota Power and Light Company has served as the case study subject utility. An initial system definition based on available wind information and near-term wind turbine generator technology is given. A WECS simulation to convert wind data to wind energy available to the utility's grid was developed along with simulations for evaluating baseline wind turbine generators and an advanced technology wind turbine. B J

**A77-49093 Diffuser augmentation of wind turbines** K M Foreman, B Gilbert, and R A Oman (Grumman Aerospace Fluid Dynamics Laboratory, Bethpage, N.Y.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 304-316 9 refs Contract No E(11-1)-2616

The Diffuser-Augmented Wind Turbine (DAWT) is an advanced concept for reducing the cost per output KW-hr of windpower. The diffuser controls the expansion of turbine exhaust flow, producing a highly subatmospheric pressure at the turbine exit, the low static pressure induces greater mass flow through the turbine vs a conventional turbine design of the same diameter. Two cost-effective model configurations were examined in the wind tunnel: one uses the energetic external wind to prevent separation of the diffuser's internal boundary layer, while the other uses high lift airfoil contours for the diffuser wall shape. The wind tunnel tests have indicated almost a doubling of wind power extraction capability for DAWTs compared to conventional turbines. B J

**A77-49094 Large windpower systems integrated with existing electric utilities** R T Smith, R K Swanson, C C Johnson (Southwest Research Institute, San Antonio, Tex.), C Ligon (Southwestern Public Service Co., Amarillo, Tex.), J Lawrence, and D. Jordan (Texas Tech University, Lubbock, Tex.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 317-327 Contract No E(11-1)-2621

This paper reports a study of the feasibility of the use of wind turbine generators as supplemental energy sources on an existing electric utility network. The time frame is the period of the next two decades. Specifically, the study is centered upon the geographical region served by Southwestern Public Service Company, an investor owned utility with present capacity of approximately 2200MW. It includes the panhandles of Texas and Oklahoma, parts of eastern



New Mexico and some communities in southwestern Kansas. Of prime importance, this region exhibits the highest wind energy potential of any area of comparable size in the continental United States (Author)

**A77-49095 Self-regulating composite bearingless wind turbine** M C Cheney and P A M Spierings (United Technologies Research Center, East Hartford, Conn.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 328-348 6 refs

The Composite Bearingless Rotor (CBR) concept has been shown to have characteristics ideally suited for wind turbine applications. Originally developed for helicopters to reduce weight, costs, and complexity, the CBR eliminates blade bearings and hinges through the utilization of the unique structural characteristics of uniaxial composite materials. This rotor concept was further developed under an ERDA contract to provide a fully self-regulating and self-aligning wind turbine. Such a system was achieved without the need for auxiliary controls or sensors. These features allow self-starting for wind initiating from any direction and automatic pitch and yaw variations to optimize performance under all normal wind conditions. The work described in this report consists of the design and fabrication of a 4.5 ft dynamically scaled wind turbine model and the successful testing of this model in the United Technologies Research Center low speed wind tunnel (Author)

**A77-49096 The Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories** E G Kadlec (Sandia Laboratories, Albuquerque, N Mex.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 349-359 8 refs ERDA-supported research

The vertical-axis wind turbine (VAWT) consists of blades having an airfoil cross section which are attached at both ends to a vertical rotating shaft and has the following advantages over conventional turbines: no need for yaw control, the delivery of mechanical power at ground level, simple support tower construction, and no pitch control required for synchronous application. The program at Sandia Laboratories emphasizes the use of the VAWT operating at constant speed to generate electricity which is fed directly into a utility grid. The program has concentrated on the development of analytical capability in support of the VAWT design, the analyses partially confirmed by testing of the existing 5 meter turbine B.J

**A77-49098 Application of chemical engineering to large scale solar energy** T A Chubb, J J Nemecek, and D E Simmons (US Navy, E O Hulburt Center for Space Research, Washington, D C.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 7*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 364-374

The paper describes the Solchem concept, according to which sunlight is converted to chemical energy in dispersed solar furnaces. The Solchem power station consists of the following components: (1) an energy orchard containing dispersed solar-furnace-heated chemical reactors, (2) an assemblage of demand responsive energy storage-boiler tanks, in which large quantities of energy are stored as latent heat-of-fusion, and (3) a conventional dry steam turboelectric generating facility. The solar orchard is characterized by the use of a gas phase working fluid both for the capture of solar thermal energy by dissociative chemical reaction and for delivery of the captured energy to the central station area. A detailed comparison of SO<sub>3</sub> and steam-methane working fluids is presented B.J

**A77-49099 High temperature thermal energy storage** R M Green, D K Ottesen, J J Bartel, and T T Bramlette (Sandia Laboratories, Livermore, Calif.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8*, Cape

Canaveral, Fla., International Solar Energy Society, 1976, p 4-47 124 refs Contract No AT(29-1) 769

This paper presents the results of a survey of current technology relating to high temperature thermal energy storage. Included in this study are the generic classes of sensible heat and latent heat storage. A summary is given of thermal storage concepts which have been designed - and in some cases constructed and tested - for high temperature applications. A review of the materials and heat transfer/fluid mechanics technologies relating to thermal storage is presented. Current technology appears to be adequate to support the development of most sensible heat concepts and simple latent heat concepts while some degree of technology advancement will be required to develop more sophisticated latent heat concepts (Author)

**A77-49100 Chemical methods of storing thermal energy** P O Offenhartz (EIC Corp., Newton, Mass.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 48-72 27 refs

Thermal energy storage through chemical reactions is reviewed including second-law restrictions and opportunities. Second-law opportunities arise when the collection temperature exceeds the utilization temperature, in this case a thermochemically driven heat pump can be used to deliver considerably more heat than is collected. Chemical reactions can be chosen to fit the source and sink temperatures so as to amplify the input heat. A number of currently proposed methods (H<sub>2</sub> generation and storage, hydration-dehydration equilibria, chemical heat pipes, and ammoniacal salt pairs) are assessed with respect to efficiency, cost, chemical feasibility, and suitability for various collection and utilization temperatures (Author)

**A77-49101 Gravel and liquid storage system for solar thermal power plants** R C Mitchell, G R Morgan (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.), and G Coleman (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 84-94 Contract No E(04-3)-1108

A new thermal storage concept is described which uses a low-cost rock bed as the primary storage medium with a suitable liquid to transfer the heat in and out of storage. Key developments are described from a current program funded by the US Energy Research and Development Administration. A preliminary design is described for the thermal storage subsystem in a 10 megawatt (electrical) pilot plant central receiver solar thermal power system. Also described is a 4 megawatt-hour capacity thermal storage system which has been designed and constructed, and will be tested during 1976 (Author)

**A77-49102 Demand sensitive energy storage in molten salts** J J Nemecek, D E Simmons, and T A Chubb (US Navy, Naval Research Laboratory, Washington, D C.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8*, Cape Canaveral, Fla., International Solar Energy Society, 1976, p 95-106

The energy storage-boiler tank concept is explained, and experimental results are presented for a material set in which a NaCl-KCl-MgCl<sub>2</sub> eutectic (MP = 385 C) is the storage medium and m-terphenyl is the heat pipe fluid. In an energy storage-boiler tank, heat energy would be stored as latent heat-of-fusion in a eutectic of naturally occurring salts, and input-output heat transfer would be effected by evaporation-condensation of a heat pipe energy transport fluid. The design of a proposed 3 m energy storage-boiler tank is described. Melt-freeze time histories of Solchemite A, a melt-cycled mix of NaCl KCl MgCl<sub>2</sub> = 24.5 20.5 55.0%, are portrayed. The components of other material sets for energy storage-boiler tanks are listed M.L.



**A77-49103 Inorganic phase change materials for energy storage in solar thermal program** R T LeFrois (Honeywell Energy Resources Center, Minneapolis, Minn) and H V Venkatesetty (Honeywell Corporate Research Center, Bloomington, Minn) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 107-122

The thermal storage subsystem research experiment is described, and the design of the thermal storage tank is explained. Test features of the thermal storage subsystem include an instrumented forced circulation steam generating system, an instrumented steam condensing system, an instrumented storage tank, and an instrumental dual steam trap station. Vaporizer design parameters and condenser design parameters are presented. Vaporizer tube scrapers are considered. Experimental data concerning the behavior of a eutectic mixture of  $\text{NaNO}_3\text{-NaOH}$ , the thermal energy storage material, are provided. The research experiment is intended to aid the design of a solar pilot plant. M L

**A77-49104 High-temperature energy storage in native rocks** M Riaz, P L Blackshear, Jr, and H O Pfannkuch (Minnesota, University, Minneapolis, Minn) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 123-137 7 refs Contract No E(11-1)-4009

The successful utilization of thermal energy derived from solar collectors, from off-peak excess thermal energy of power plants, and from industrial process or waste heat systems is predicated upon the development of suitable storage systems which provide the necessary buffer and matching function between the time-varying thermal energy inputs and the output thermal and electrical loads. This paper explores the technical feasibility of large-volume packed beds using native earth or rock materials for long-duration (months) storage of thermal energy at high temperatures (up to 500 C) and power levels (in the tens of MWt range) compatible with electric power generation and community heating in total energy systems context. The advantages of this storage concept derive from the inherent simplicity of the overall system, from its utilization of low-cost, on-site, native materials resulting in potentially minimum environmental impact, and from the increased energy density obtainable with large temperature swings. A generic configuration of heat accumulators involving arrays of pebble-filled trenches (or holes) surrounded by undisturbed earth and fed by hot air from above or below is examined. (Author)

**A77-49105 Thermal storage in metals** C E Birchenall and M Telkes (Delaware, University, Newark, Del) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 138-154

Halides and oxides with phase transformations or eutectics in the range of 200 to 800 C have been studied as heat storage materials. Several abundant and cheap metals, notably Al, Cu, Mg, Si, and Zn as binary or more complex alloys, have eutectic transformations that store comparable or larger amounts of heat. Their high molar densities yield small storage volumes, and high thermal conductivities simplify heat transfer. Containment should be easier than for oxides and halides. Thermodynamic theory shows that alloys selected for heat storage should have highly disordered eutectic liquids that freeze to well-ordered strongly bonded solid phases. Heat storage in several promising binary and ternary alloys for which data are available has been estimated at three levels of approximation to illustrate the approach that is being used to identify suitable systems and the uncertainties that need to be resolved by additional experiments. (Author)

**A77-49106 \* Thermal energy storage using large hollow steel ingots.** R H Turner (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) In *Sharing the sun Solar*

*technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8*

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 155-162 Contract No NAS7-100

High temperature thermal energy storage (to 500 C = 930 F) using hollow steel ingots is investigated. Preliminary studies indicate that the system should be reliable, be characterized by low operation and maintenance costs, and be associated with low development risk. The estimated installed system energy unit storage cost is \$13 50/kWh-t. (Author)

**A77-49107 An assessment of hydrogen as a means to store solar energy** R Ramakumar (Oklahoma State University, Stillwater, Okla) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 163-175 28 refs ERDA-supported research, NSF Grant No AER-75-00647

A brief review and assessment of the use of hydrogen as a means to store solar energy is presented. Electrolytic and non electrolytic methods proposed for hydrogen production from solar energy, hydrogen storage methods and utilization techniques are surveyed. Overall system concepts with several manifestations of solar energy as inputs are discussed along with their efficiencies and economic aspects. (Author)

**A77-49108 Thermal energy storage by the sulfuric acid-water system** D D Huxtable and D R Poole (Rocket Research Corp, Redmond, Wash) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 178-191 8 refs Contract No E(04-3)-1185

The sulfuric acid-water storage system utilizes solar thermal energy to evaporate water from a sulfuric acid-water solution. The sulfuric acid and water are stored separately until heat is required. Upon recombination of the concentrated acid and water, heat is released which can be used for building heating and cooling, water pumping, or other uses. Results of an investigation aimed at defining potential problem areas and providing practical solutions are presented. Potential applications of the system are discussed, and preliminary design and cost information on a seasonal storage application is presented. (Author)

**A77-49109 Storage of solar energy by inorganic oxide/hydroxides** G Bauerle, D Chung, G Ervin, J Guon, and T Springer (Rockwell International Corp, Atomics International Div, Canoga Park, Calif) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 192-218 5 refs ERDA-sponsored research, NSF Grant No AER-74-09069

A novel thermal-energy storage concept involving the use of inorganic oxides/hydroxides such as  $\text{MgO/Mg(OH)}_2$  and  $\text{CaO/Ca(OH)}_2$  is under investigation. Solar energy at high temperatures (about 350 to 550 C) is used to drive off, in the form of steam, the chemically bound water from the hydroxide. At a later time, when the sun's energy is not available, water or steam can be injected into the resulting oxide material, thus yielding heat energy from the exothermic reaction of water with the oxide. The physical and chemical properties of the  $\text{MgO/Mg(OH)}_2$  systems, particularly the reaction rates, thermal conductivity, vapor pressure, and particle characteristics, have been investigated in detail. A reference design of an  $\text{MgO/Mg(OH)}_2$  storage system for heating and cooling of buildings has been prepared, and a variety of other applications of these systems have been studied. (Author)

**A77-49110 Reversible oxidation of metal oxides for thermal energy storage** J A Simmons (Science Applications, Inc, McLean, Va) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 8* Cape Canaveral, Fla., International Solar Energy Society, 1976, p 219-225 12 refs

Decomposition of metal oxides, especially peroxides and super-oxides, are proposed as reversible reactions to store thermal energy. Certain oxides have potentially high energy density and could use air for the source of oxygen. Feasibility is yet to be demonstrated experimentally. (Author)

**A77-49111 Thermal energy storage with saturated aqueous solutions** K W Kauffman and H G Lorsch (Franklin Institute Research Laboratories, Philadelphia, Pa.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 8

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 227-237 Contract No E(40-1)-5158

A method of thermal energy storage at temperatures of 0 C to 120 C is being developed for application to solar space heating, water heating, and air conditioning. The method uses saturated aqueous solutions of salts which dissolve endothermically and have large coefficients of solubility with temperature. Latent heat of crystallization is continuously released on cooling and absorbed on heating, resulting in specific heat capacities up to 480 percent of the specific heat of water. Over a 10 C range of temperature, storage densities can be achieved which are in the same range as those of latent heat of fusion materials. Since the solutions are pumpable, systems employing them do not require the expensive container/heat exchangers characteristic of latent heat devices using phase change materials. Total costs for a 10 to the eighth joule storage device are 1/4 to 1/2 the cost of devices using sodium thiosulfate pentahydrate or 50% water-ethylene glycol. (Author)

**A77-49112 Experimental study of the subsurface transport of water and heat as related to the storage of solar energy** F J Moiz, J C Warman, T E Jones (Auburn University, Auburn, Ala.), and G E Cook. In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 8. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 238-244 6 refs. Research supported by the U S Department of the Interior, Alabama Power Co., and ERDA.

**A77-49113 An immiscible fluid - Heat of fusion energy storage system** D D Edie and S S Melshimer (Clemson University, Clemson, S C.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 8. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 262-272 14 refs.

Preliminary studies of a novel heat of fusion energy storage system have been conducted. This system uses direct contact heat transfer between an aqueous crystallizing solution and an immiscible heat transfer fluid. The phase change solution is permanently contained in an insulated storage tank. A heat transfer fluid (which is immiscible in the phase change solution) is circulated through the solution and transfers heat either to or from the solution. By eliminating permanent heat exchange surfaces, this immiscible fluid system avoids the phase stratification problem which has negated the potential storage efficiency of many previous heat of fusion systems. The target energy density for this heat storage system design is 3.5 x 10 to the eighth joules per cubic meter. The estimated cost for storage of 10 x 10 to the ninth joules is \$1,100. (Author)

**A77-49114 Reinforced pillow solar water heater** R R Davison and W B Harris (Texas A & M University, College Station, Tex.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 8. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 366-371

The pillow solar water heater is formed by confining a flexible bag between supporting elements to give it strength to withstand pressure. This narrows the flow channels resulting in a number of advantages. Fabrication details and some performance data are given with some discussion of economic factors and probable applications. (Author)

**A77-49115 Payback of solar systems** K W Boer (Delaware, University, SES, Inc., Newark, Del.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 9

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 1-17 11 refs. Research sponsored by SES, Inc.

A variety of solar conversion systems is studied in a dynamic economical model in which the real cost of energy inflates Payback times and dates of probable market entries are estimated. A distributed system to convert solar energy into heat and electricity in direct proximity to the consumer (Solar One System) is economically attractive even for solar cells with well below 10% conversion efficiency when these can be installed in flat plate collectors for less than twenty dollars per square meter, in addition to the collector cost. (Author)

**A77-49116 Solar system market capture in the climato-economic regions of the United States** W H McCumber, Jr (IBM Corp., Federal Systems Div., Huntsville, Ala.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 9

Cape Canaveral, Fla., International Solar Energy Society, 1976, p 18-31 6 refs.

Penetration of solar energy systems into construction markets is determined by the economic expectations of the consumer. Since individual customization is impractical, regions of similar economic and climatological characteristics may be defined against which to optimize designs. This paper defines 51 climato-economic regions of the US and demonstrates two computerized analytical tools, CERES (Comprehensive Economic Recovery Evaluation System) and CAP (Capture Analysis Program), which extrapolate the technical and economic performance of region-optimal systems into national market capture expectations. Used iteratively, CERES and CAP evaluate the sensitivity of market capture to incremental changes in technical characteristics or economic environment. (Author)

**A77-49117 The feasibility of solar house heating - A study in applied economics** A Shams and R Fichtenbaum (Washington University, St Louis, Mo.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 32-50 6 refs.

The economic feasibility of solar space heating for an average insulated single-family dwelling in St. Louis, Missouri is analyzed. Factors relating to climate, the heat loss coefficient of residential structures, fuel costs and the capital costs of solar heating systems of various sizes were taken into account in establishing an optimal combination of solar and conventional forms of heating. A computer simulation was used to model systems of various capacities. The microeconomic technique of marginal analysis was employed in comparing capital costs of the solar heating plants with marginal savings resulting from the use of conventional fuels, the combination of solar and conventional heat which would minimize heating costs and conserve conventional fuels was determined. The role of government tax credits in providing incentives for the installation of high capacity solar units is also discussed. J M B

**A77-49118 A parametric study of critical fuel costs for solar heating in North America** J A Duffie, W A Beckman, and M J Brandemuehl (Wisconsin, University, Madison, Wis.) In *Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference*, Winnipeg, Canada, August 15-20, 1976 Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p 51-63 5 refs. Contract No E(11-1)-2588

Critical fuel energy cost is defined as the cost of delivered energy from conventional sources below which heat from optimized solar systems is more expensive than heat from conventional sources. The critical fuel energy cost is a useful index to assess the feasibility of solar heating in any location or region. A method is presented for estimating the index value for particular locations, buildings, solar collectors, and solar heating system costs. Tables are given which

permit determination of critical fuel energy cost as a function of system costs for 96 stations in the United States and Canada. Examples of the determination are shown for two of these stations. (Author)

**A77-49119** Incentives and barriers to the development of solar energy. R H Bezdek and P D Maycock (ERDA, Div of Solar Energy, Washington, D C). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 64-73.

Incentives and barriers to the widespread utilization of solar water and space heating, solar space cooling, agricultural and industrial process heat from solar energy, photovoltaic systems and solar space systems are discussed. High capital costs, restrictive zoning ordinances, controlled fossil fuel prices, and legal and regulatory restraints are cited as barriers to the introduction of the various types of solar energy systems, income tax credits, loan guarantees, interest subsidies, property and sales tax exemptions, investment tax credits, the integration of solar energy systems into utility networks and the dissemination of information are mentioned as factors promoting the use of solar energy. J M B

**A77-49120** Interfacing building design and solar energy research and standards. J K Holton (National Bureau of Standards, Center for Building Technology, Washington, D C). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 74-82. 11 refs.

Research reports and standards developed in the field of solar energy by the US National Bureau of Standards are discussed. Technical evaluations, dealing with such topics as methods for rating liquid and air collectors and thermal storage units, thermal load simulation models, standards for solar energy system performance data, materials standards, and thermal performance of wood or masonry buildings, are listed. Draft standards and design guides, treating such subjects as site planning for solar energy utilization, or retrofitting a residence for solar heating and cooling, are also mentioned. In addition, associated studies, including economic analyses and a survey of solar energy legislation at the state level, are described. J M B

**A77-49121** Daedalophobia - Diagnosis and prognosis. H D Foster and W R D Sewell (Victoria, University, Victoria, British Columbia, Canada). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 83-90. 11 refs.

Difficulties associated with the adoption of solar space heating systems in Canada are considered. The funding levels for government-sponsored research and development of solar heating systems in Canada are found to be inadequate, a lack of capital investment in the building materials industries is also noted. Nonuniform building codes in Canadian localities are cited as having a detrimental effect on the introduction of solar space heating systems. Dissemination of information on the cost and effectiveness of solar heating systems is discussed. J M B

**A77-49122** Assessment of the socio-economic and environmental aspects of the central receiver power plants. M Davidson, D Grether, and M Horowitz (California, University, Berkeley, Calif). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 91-96. 11 refs. ERDA-supported research.

**A77-49123** Effect of solar home heating on electric utilities. H G Lorsch (Franklin Institute Research Laboratories, Philadelphia, Pa). In Sharing the sun. Solar technology in the

seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 97-112. 12 refs. NSF Grant No. C-1033.

The effect of introducing residential solar heating was modeled for two electric utilities in the Northeastern U.S., one experiencing a summer peak demand, the other a winter peak. For solar-heated homes with electric resistance back-up heating, the annual load factor is found to be approximately 40% lower than that of the conventionally heated residence. However, on the coldest day of the year, both types of heating system will place the same load demand on the utility. This identity of peak demand, together with the costs related to the installation of electrical facilities, may lower actual energy savings for the consumer using a combination of solar energy and conventional heating. Alternative rates that would reimburse the utilities for costs of integrating solar heating systems into power networks are considered. J M B

**A77-49124** Economic study of solar total energy. R W Harrigan (Sandia Laboratories, Albuquerque, N Mex). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 113-127.

This paper investigates the application of solar total energy to a 2000-dwelling-unit mixed-load community. The community design is consistent with current community planning practices. An energy analysis of the community was performed, and a solar total energy system sized to meet the community demands. The economics of providing a solar total energy system is examined. The effect of dwelling-unit density is examined. (Author)

**A77-49126** Solar energy application considerations for housing in depressed communities. A E Smith, N Lior, S Z Klausner (Pennsylvania, University, Philadelphia, Pa), and S I Stanic. In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 137-154. 26 refs.

Some of the social and physical implications of possible government programs for subsidizing the application of solar heating technology for poor households and depressed communities. Existing and proposed government energy-related programs and legislation are evaluated for their effectiveness in relieving the impact of rising energy prices on household consumption patterns of the poor. Social, economic, technological, and architectural aspects of solar heating applications in depressed communities are considered. The conclusion reaffirms the systematic nature of housing, energy, and welfare problems. Some of the major recommendations include accelerating rehabilitation of the existing housing stock, demonstrating solar projects in depressed communities, and reducing welfare costs through government energy-related programs. (Author)

**A77-49127** Solar energy and urban settlements. R K Swartman (Western Ontario, University, London, Canada). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 155-161.

This paper reviews the influence of energy on urban settlement patterns in the past. It then suggests possible patterns in the future as society turns towards solar energy as a major energy source. (Author)

**A77-49128** Technical and socio-economic aspects of solar energy and rural development in developing countries. R Ramakumar (Oklahoma State University, Stillwater, Okla). In Sharing the sun. Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 162-176. 21 refs. NSF Grant No. AER 75 00647.

In developing countries, the losing race between demography and development is resulting in the emergence of the dual economy. Unless checked, this will lead to social and political tensions with global consequences. A healthy and dynamic rural growth is necessary to correct this situation. Energy can play a vital role in this process. A step-by-step approach is presented for the adoption of technologies designed to exploit renewable (solar) energy sources at the rural level. It is centered around the establishment of rural energy centers to improve the basic living environment. In due course, the role of these centers is to be expanded to encompass agricultural and small-scale industrial activities. The technical and socio-economic aspects of the step-by-step introduction of solar energy systems in rural areas in developing countries are discussed. (Author)

**A77-49129**      **Solar high technology and architecture** P. Tabb, A. Brown, and R. Hower (Joint Venture, Inc., Boulder, Colo.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 177-189.

The impact of solar mechanical systems upon multi-family housing in the Colorado region is described. Technical constraints encountered in the planning and architectural design phases, especially collector area intensiveness, are discussed. Four distinct multi-family housing forms matched with five generic solar mechanical systems are analyzed and illustrated. As an outgrowth of this analysis a student apartment building currently under construction was developed. This project, consisting of eight 4-bedroom units, has an area of 8,600 square feet. A Compound Parabolic Concentrating (CPC) Collector System delivers 74% of the annual space heating and domestic hot water demand. Due to the abundance of direct insolation in the Colorado area, the high efficiency of the solar mechanical system, and the energy responsive building design, a floor area-to-collector area ratio of 10:1 is achievable. (Author)

**A77-49130**      **Some institutional problems of residential solar heating** J. F. Blair, Jr. and J. O'Brien (Franklin Institute Research Laboratories, Philadelphia, Pa.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 190-199. 5 refs.

Because of the overwhelming influence of financial institutions on the building market, the paper puts forward the concept that governmental actions are required if solar-assisted heating systems are to become an acceptable technology in the near future. Barring radical changes, a large scale introduction of solar-assisted heating will not come about through economic forces alone. The key lies in subsidies which could be in the form of tax abatements to building owners, subsidies by utilities to building owners, preferential utility rates, and, most importantly, a credible and consistent energy policy on the part of the government. (Author)

**A77-49131**      **Economic and institutional rationale for solar retrofitting - Case example 'Project Sunshower'** D. W. Aitken, G. E. Guttormsen, W. T. Schooler, and C. Koland (San Jose State University, San Jose, California). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 200-211.

It is suggested that universities and colleges begin immediately to apply solar energy design criteria and systems to their facilities. The experience at San Jose State University has demonstrated the growth of opportunities for further solar energy applications after an institutional commitment to begin the first major on-campus solar construction project had been made. It is also argued that lifetime cost analysis should be employed, but only in parallel to an appraisal of the benefits of solar systems in assuring reliability and continuity of institutional function during fuel shortages. San Jose State University's retrofit of three residence halls to a 9,000-square foot solar-assisted hot water system is utilized as an example. (Author)

**A77-49132**      **Report on United States international co-operation in solar energy technology development** L. O. Herwig and H. C. Yim (ERDA, Div. of Solar Energy, Washington, D.C.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 213-228.

The international cooperative exchange program administered by the Division of Solar Energy of ERDA are discussed. The chief areas of concern in the solar energy exchange programs, including thermal and solar electric applications, the conversion of biomass to fuels, and technological support and information services, are considered. Multilateral agreements arranged under the auspices of the International Energy Agency, including exchanges of information on solar heating, cooling and hot water system components, the mechanical testing of solar collectors, and measurements of solar radiation, are mentioned. Bilateral agreements with the U.S.S.R., Japan, France, and other nations, which have dealt with topics such as desalinization schemes, large-scale water heating plants and photovoltaic devices, are also reviewed. (Author)

**A77-49133**      **Description of Provident House, King City, Ontario** J. Hix. In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 229-235.

The paper describes the design of a house which incorporates a solar heating system and other features to minimize energy require-

**A77-49134**      **User needs vs. technical demands, or the art of tradeoff in making a good, inexpensive solar home** N. Miley and R. Pierce. In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 236-250. 11 refs.

The design, construction and evaluation of an inexpensive single-family dwelling employing solar space heating in conjunction with conventional heating are discussed. The dwelling was designed for a climate having cold winters and hot summers, a Trombe-Micheal type solar collector was used to provide 70 to 90% of the winter heating requirements of the residence. Construction methods, particularly insulation practices, which emphasized reliance on inexpensive materials that could be assembled by relatively unskilled laborers, are also described. The initial cost of the 1150-square foot home was approximately \$15,500. J. M. B.

**A77-49136**      **The updated homesteader** T. Dean (Kansas University, Lawrence, Kan.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 257-261.

The paper describes the design and construction of a minimum energy dependent home for a middle-aged American couple whose environmental expectations are typical of many people. The utilization of solar and wind energy, together with gardening as a hobby, produced a host of related activities which effectively changed their lifestyle. Surprisingly, this unassuming and personal home has elicited widespread public attention. Primary energy for the home is provided by a 570 square foot roof-mounted flat plate collector, a 3.2 kw wind generator, and a wood-burning stove. (Author)

**A77-49137**      **Self sufficient energy integrated design and construction method for low cost self help housing programs** A. C. Clements (A. C. Clements and Associates, Engineers, Planners and Architects, San Juan, P.R.) and K. G. Soderstrom (Universidad de Puerto Rico, Mayaguez, P.R.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 9. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 262-275.

A method for the design and construction of low cost self-sufficient communities of permanent dwellings for subtropical and tropical countries is described. Particularly addressed are the locations where there are acute rehabilitation problems and a shortage of financial resources available for building and maintaining such communities. Using reinforced concrete as the prime material, the design integrates the benefits of solar energy, self-help labor concepts, and bio-gas waste disposal methods, the emphasis was on housing large numbers of people in a population where the average annual per capita income is five hundred dollars. The design, confirmed by computation of the viability of the structural and energy systems, also estimated the economic and social consequences, based on a study of local conditions of a far-eastern country (Author)

**A77-49138** Perceptual assessment of a new energy concept D Lorrman In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 9 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 276-281

The paper describes a preliminary evaluation of the perceptual impressions of the adaptation of a building design incorporating new energy concepts. Preliminary work of this nature is related to the Meadowvale Solar Experiment in Mississauga, Ontario. The comments are summarized and preliminary conclusions drawn in an attempt to gain a better insight into the task of integrating this new technology into a society set in well-established preconceptions (Author)

**A77-49139** Rural energy centre for Africa using solar, wind and biogas energies T A Lawand, R Alward, B Saulnier, H P Budgen, and E Brunet (McGill University, Ste Ann de Bellevue, Quebec, Canada) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 9 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 282-309 Research supported by the United Nations

A rural energy center utilizing solar, wind and biogas energies in order to satisfy the basic energy needs, has been designed for a typical village in Senegal. The parameters of site selection, and the balance between the supply and demand for energies are discussed. In the center, energy will be supplied for water pumping and potabilization, cooking and some lighting. The energy required for cooking is about 80 percent of the total demand. All social, technical and economic factors have been considered in making the selection of equipment needed. The concept of an Appropriate Technology approach has been followed in undertaking the study (Author)

**A77-49140** The Crain solar house - A case study in the architectural and engineering design process as applied to solar housing for public sale H A Wade In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 10 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 8-17

**A77-49141** Report on the design, construction, and marketing of two solar heated SPEC houses C B Winn (Colorado State University, Solar Environmental Engineering Co., Inc., Fort Collins, Colo.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 10 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 18-34

The solar heating and cooling demonstration program of the Department of Housing and Urban Development (HUD), aimed at providing seed money for the design, installation, and marketing of solar systems in residential-type structures is reviewed. As a result of this program, two solar-heated houses have been built in and near Fort Collins, Colorado. One of the houses involves an air system whereas the other incorporates a water system. The air system will utilize the Solaron system while the water system makes use of

Reynolds Metals Company collectors. The water system also utilizes baseboard radiation for house heating in a manner which improves the performance of the solar system. Details of the design of the solar systems for both houses, together with a discussion of problems encountered during installation and suggestions for avoiding installation problems, are presented (Author)

**A77-49142** Commercialization of solar heating and cooling of buildings A C Johnson (Mitre Corp., McLean, Va.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 10 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 35-39

The use of Federal building programs and Federal agencies to promote solar heating and cooling as a viable option in construction programs is discussed. It is suggested that building codes and regulations be modified to encourage introduction of solar energy systems, development of credible cost and performance data for the hardware involved is also urged. An analysis of dislocations in the construction industry which may be caused by the widespread adoption of solar heating and cooling is proposed. In addition, benefits of increased use of solar energy systems, including reduction of U.S. dependence on imported fuels and improvements in environmental conditions, are cited J M B.

**A77-49143** Design factors for a cost effective solar collection system C H Holtyn, D J Laudig, and T W Schmidt (Reynolds Metals Co., Richmond, Va.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 10 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 40-45

The design of solar collecting systems which are inexpensive and can be installed and maintained economically is discussed. Use of water treatment to prolong the life of hydronic solar energy systems, reliance on similar construction materials to reduce galvanic corrosion, and adoption of closed-loop systems employing heat exchangers are suggested as means for developing cost-effective solar collecting systems. The effect of prefabrication of supports and tubing for solar collectors is also assessed, a sample problem involving computation of the cost per square foot for installation of a system of ten collectors, together with tubing and supports, is given J M B.

**A77-49144** Minimum Energy Building - The first winter's operation D L McClenahan and H P Misuriello (New York, State University, Albany, N.Y.) In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 10 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 79-89

Through a special grant from the New York State Legislature, a solar heated Minimum Energy Building was constructed at the Atmospheric Sciences Research Center, State University of New York at Albany. Design precedents, building construction and system operation are discussed. After evaluating the first winter's performance, it is concluded that the design concepts of monolithic structure, massive insulation, structural thermal storage and efficient solar collectors are valid and provide a method for implementing solar space heating in cold climates (Author)

**A77-49147** Solar air conditioning applications for warm humid climate T G Olsen (Miami, University, Coral Gables, Fla.) and R K Swartman (Western Ontario, University, London, Canada). In Sharing the sun Solar technology in the seventies, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976 Volume 10 Cape Canaveral, Fla., International Solar Energy Society, 1976, p 126-134

Air conditioning in warm humid climates presents certain difficulties as well as advantages associated with the given climatic conditions. Humidity control by conventional cooling methods depends upon the use of coil temperatures low enough to achieve the proper dew point temperature for the conditioned air. The solar-

driven absorption unit loses both capacity and performance when lower evaporation temperatures are required. In order to use absorption refrigeration more effectively in solar energy systems, it is desirable to perform latent removal by an auxiliary means. Liquid and dry desiccants provide a means of accomplishing this objective. Alternative methods of accomplishing separate latent heat removal may also be considered. (Author)

**A77-49148** The design of a solar cooling and heating system for a commercial building. W. O. Carter (Herman Blum, Consulting Engineers, Dallas, Tex.) In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 135-142.

A 320-ton solar cooling and heating unit designed to service a 90,000-square foot commercial building in Arizona is described. The cooling system utilizes a single lithium-bromide and water absorption refrigeration machine powered by hot water; refrigeration is distributed through a chilled water system. Factors taken into account in developing the unit included cooling of the interior light fixtures of the building, maintenance of an adequate ventilation air flow rate, and the integration of outside air cooling with adiabatic cooling. In addition, providing freeze protection for the collectors and a heat-release mechanism was considered. J. M. B.

**A77-49149** Dual Phase Annual Cycle for residential heating and cooling. D. Cerruti. In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 143-146.

The Dual Phase Annual Cycle (DPAC), a heating and cooling system using two thermal storage tanks (hot and cold), flat-plate solar collectors, and state-of-the-art hardware, is described. DPAC is compared to the Annual Cycle Energy System, developed by H. C. Fischer at Oak Ridge National Laboratory. Applications to the traditional single family dwelling and to an apartment complex are considered. Materials and methods of storage-tank construction are proposed. Some factors influencing the potential for commercial success are cited. (Author)

**A77-49151** The performance of homemade solar collectors at the Stockton State College 'Energy House'. H. E. Taylor (Stockton State College, Pomona, N.J.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 158-164. Research supported by the Stockton State College Foundation.

**A77-49152** Solar economics in Illinois. E. F. Barfield and A. J. Casella (Sangamon State University, Springfield, Ill.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 165-170. 8 refs.

Operating costs for houses utilizing conventional fuels for heating, hot water, and/or cooling are compared with those for identical houses that utilize solar energy for the same purposes. Three different sized houses were considered at six different locations in Illinois. Solar insolation data was gathered or calculated for each location. Heating, hot water, and/or cooling load were calculated for each house along with system performance utilizing five different sized solar systems. Yearly operating costs for the solar equipped houses were calculated based upon a 20-year life cycle, 8% interest rate, and collector costs of \$8, \$10, or \$12 per square foot. (Author)

**A77-49153** Thermal energy storage and transportation. V. J. Sevcik (Argonne National Laboratory, Argonne, Ill.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint

Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 177-182. 13 refs. ERDA-sponsored research.

The application of thermal energy storage concepts to the design of an automobile propulsion system capable of competing with that of electric vehicles is discussed. The proposed vehicle would utilize a thermal storage source, such as a molten salt heat battery, to power a thermal engine. Various materials, including lithium fluoride, sodium chloride, or silicon are considered as candidates for use in the heat batteries; thermal engines based on the Brayton, Rankine, or Stirling cycle are also assessed. It is concluded that a lithium-fluoride battery used in conjunction with a Stirling engine may be the best prospect for development. The reliability, safety and simplicity of the proposed vehicle are analyzed. J. M. B.

**A77-49154** Design, operation and economics of the Energy Plantation. M. D. Fraser, J. F. Henry, and C. W. Vail (InterTechnology Corp., Warrenton, Va.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 188-193. 5 refs. Research supported by the American Gas Association, Grant No. DACA23-74-C-009.

An Energy Plantation is a means for producing fuels by collecting and storing solar radiation in plants grown purposely for their fuel value. Appropriate selection of plant species and plantation cultural practices is the key to producing fuels by this means at attractive cost. This paper discusses how the Energy Plantation is designed and operated for maximum productivity of plant material. The cost of the fuel produced is estimated to be less than \$1.20 per million BTU of useful heating value. (Author)

**A77-49155** Residential application of photovoltaic energy systems. E. F. Federmann, P. F. Pittman, S. Nearhoof, and P. R. Rittelmann (Westinghouse Electric Corp., Pittsburgh, Pa.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 206-211.

The prospect of reduced cost photovoltaic material creates a potential for on-site systems that can provide the bulk of residential electrical and thermal requirements. The likelihood of increased energy costs combined with increased system use with time should assure economic viability in virtually all regions of the United States in about twenty years. The sizing, economic viability, and performance of various photovoltaic systems were determined for seven geographical regions on a study just completed for ERDA. Of these, one of the Atlanta, Ga. type residences was chosen for this discussion. A specific system and function is specified, as well as all necessary subsystems. (Author)

**A77-49156** On the analysis and design of grid structures for p-n junction solar cells. J. L. Boone and T. P. Van Doren (Missouri-Rolla, University, Rolla, Mo.). In *Sharing the sun: Solar technology in the seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 212-217. 5 refs.

A one-dimensional distributed diode model for the p-n junction solar cells is utilized to develop analytical expressions for solar cell V-I characteristics as a function of short circuit current, sheet resistance, grid spacing, thermal voltage and open circuit voltage. Experimental results are given to show that these expressions may be utilized to determine the effects of sheet resistance, grid spacing and sunlight intensity upon the solar cell output. The relation of the parameters to the fill factor is also discussed. Results indicate the p-n junction parameters will dictate the maximum grid spacing for given light intensity but the minimum spacing is still controlled by the metal contacting techniques. (Author)

**A77-49157** Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists. M.

Connolly, R. Giellis, C. Jensen, and R. McMordie (Martin Marietta Aerospace, Denver, Colo.) In *Sharing the Sun Solar Technology in the Seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 220-234. 5 refs. Contract No. E(11-1)-2876.

Emphasis on solar energy for use in space heating and cooling presents a problem for many architects, heating, ventilating and air conditioning engineers, and contractors because they lack expertise in solar applications. This paper describes two public-domain computer design programs, written for use by the solar community SOLCOST, a simplified sizing design method for nonthermal specialist users, computes an optimum collector area and tilt angle from a life cycle cost analysis. SOLCOST computes heating or cooling loads using a thermal network method. Data banks in SOLCOST provide the user with parameters needed for the solar and life cycle cost analyses. Collector performance is modeled using the percent of possible sunshine measurement. A simulation program, SOLSIM, has also been developed using thermal network methods. SOLSIM input decks are available for five typical solar systems. The solar analysis and life cycle cost methodology are presented, along with descriptive sample problems. (Author)

**A77-49158** Georgia Tech 400 KWth solar thermal test facility. J. D. Walton, Jr., S. H. Bomar, Jr., and N. E. Poulos (Georgia Institute of Technology, Atlanta, Ga.) In *Sharing the Sun Solar Technology in the Seventies*, Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volume 10. Cape Canaveral, Fla., International Solar Energy Society, 1976, p. 245-258, 6 refs.

Under ERDA sponsorship Georgia Tech is constructing a 400 KWth solar test facility for high temperature solar energy research and development. The Georgia Tech facility utilizes 550 round mirrors 111 centimeters in diameter which may be operated flat or focused to provide radiant heat fluxes from 25 to 200 W/sq cm to a test area centrally located above the mirror field. Scheduled to be completed in January 1977, it will be used first to heat a boiler-superheater to deliver 365 Kg/hr of steam at 150 atmospheres and 600 C. Other uses include evaluation of experimental receivers utilizing such heat transfer fluids as steam, air, helium, oil, molten salts and liquid metals, and basic research in the areas of metals, ceramics and coatings. (Author)

**A77-49160 \* #** Fundamental studies of black chrome for solar collector use. G. McDonald, B. Buzek, and H. Curtis (NASA, Lewis Research Center, Cleveland, Ohio). *International Solar Energy Society and Solar Energy Society of Canada, Joint Conference on Sharing the Sun Solar Technology in the Seventies*, Winnipeg, Canada, Aug. 15-20, 1976, Paper 4 p.

The thicknesses of black chrome plated for various times have been measured from electron photomicrographs and correlated with the solar spectrum absorptance and infrared emittance as calculated from spectral reflectance measurements. The maximum absorptance is reached at an average thickness of 0.5 micrometer. The emittance increases only slightly up to 1.0 micrometer but increases rapidly at thickness above 1.0 micrometer. (Author)

**A77-49161 \* #** Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator. S. M. Johnson and F. F. Simon (NASA, Lewis Research Center, Cleveland, Ohio). *International Solar Energy Society and Solar Energy Society of Canada, Joint Conference on Sharing the Sun Solar Technology in the Seventies*, Winnipeg, Canada, Aug. 15-20, 1976, Paper 19 p. 9 refs.

The measured thermal efficiencies of 35 collectors tested with a solar simulator, along with the correlation equations used to generalize the data, are presented in this report. The single correlation used is shown to apply to all the different types of collectors tested, including one with black paint and one cover, one with a selective surface coating and two covers, and an evacuated-tube collector. The test and correlation technique is also modified by using a shield so that collectors larger than the simulator test area can

also be tested. This technique was verified experimentally for a shielded collector for which the collector shielded area was 31% of the solar simulator radiation area. A table lists all the collectors tested, the collector areas, and the experimental constants used to correlate the data for each collector. (Author)

**A77-49162 \* #** Performance correlations of five solar collectors tested simultaneously outdoors. D. R. Miller (NASA, Lewis Research Center, Cleveland, Ohio). *International Solar Energy Society and Solar Energy Society of Canada, Joint Conference on Sharing the Sun Solar Technology in the Seventies*, Winnipeg, Canada, Aug. 15-20, 1976, Paper 26 p.

Collector thermal efficiency, and efficiency degradation with time were measured for 5 flat-plate solar collectors tested simultaneously in an outdoor solar collector test facility. Results indicate that by using collector performance parameters which account for diffuse insolation, outdoor data recorded on 'cloudy' days can be used as a measure of performance, as long as the ratio of direct to total insolation exceeds approximately 0.6. These outdoor results also show good agreement with thermal efficiency data obtained indoors in a solar simulator. Significant efficiency degradation occurred on only one of the five collectors exposed to outdoor conditions for a period of one to two years. (Author)

**A77-49163 \* #** An experimental investigation with artificial sunlight of a solar hot-water heater. F. F. Simon (NASA, Lewis Research Center, Cleveland, Ohio). *International Solar Energy Society and Solar Energy Society of Canada, Joint Conference on Sharing the Sun Solar Technology in the Seventies*, Winnipeg, Canada, Aug. 15-20, 1976, Paper 19 p. 8 refs.

Thermal performance measurements were made of a commercial solar hot-water heater in a solar simulator. The objective of the test was to determine basic performance characteristics of a traditional type of flat-plate collector, with and without side reflectors (to increase the solar flux). Due to the fact that collector testing in the solar simulator permits control of the variables that affect collector performance, it was possible to obtain information on each of the following: (1) the effect of flow and incidence angle on the efficiency of a flat-plate collector (but only without side reflectors), (2) transient performance under flow and nonflow conditions, (3) the effectiveness of reflectors in increasing collector efficiency for a zero radiation angle at fluid temperatures required for solar air conditioning, and (4) the limits of applicability of a collector efficiency correlation based on the Hottel-Whillier equation (1958). (Author)

**A77-49164 \* #** Initial operation of a solar heating and cooling system in a full-scale solar building test facility. R. H. Knoll, D. Miao (NASA, Lewis Research Center, Cleveland, Ohio), I. L. Hamlet, and R. N. Jensen (NASA, Langley Research Center, Hampton, Va.). *International Solar Energy Society and Solar Energy Society of Canada, Joint Conference on Sharing the Sun Solar Technology in the Seventies*, Winnipeg, Canada, Aug. 15-20, 1976, Paper 17 p.

The Solar Building Test Facility (SBTF) located at Hampton, Virginia became operational in early summer of 1976. This facility is a joint effort by NASA-Lewis and NASA-Langley to advance the technology for heating and cooling of office buildings with solar energy. Its purposes are to: (1) test system components which include high-performing collectors, (2) test performance of complete solar heating and cooling system, (3) investigate component interactions and (4) investigate durability, maintenance and reliability of components. The SBTF consists of a 50,000 square foot office building modified to accept solar heated water for operation of an absorption air conditioner and for the baseboard heating system. A 12,666 square foot solar collector field with a 30,000 gallon storage tank provides the solar heated water. A description of the system and the collectors selected is given here, along with the objectives, test approach, expected system performance and some preliminary results. (Author)

**A77-49165 \* #** Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation. D.

Namkoong (NASA, Lewis Research Center, Cleveland, Ohio) *International Solar Energy Society and Solar Energy Society of Canada, Joint Conference on Sharing the Sun Solar Technology in the Seventies, Winnipeg, Canada, Aug 15-20, 1976, Paper 10 p 8 refs*

A 3-ton lithium bromide absorption water chiller was tested for a number of conditions involving hot-water input, chilled water, and the cooling water. The primary influences on chiller capacity were the hot water inlet temperature and the cooling water inlet temperature. One combination of these two parameters extended the output to as much as 125% of design capacity, but no combination could lower the capacity to below 60% of design. A cooling system was conceptually designed so that it could provide several modes of operation. Such flexibility is needed for any solar cooling system to be able to accommodate the varying solar energy collection and the varying building demand. It is concluded that a 3-ton absorption water chiller with the kind of performance that was measured can be incorporated into a cooling system such as that proposed, to provide efficient cooling over the specified ranges of operating conditions.

(Author)

**A77-49166** **Solar energy conversion with fluorescent collectors.** A. Goetzberger and W. Greubel (Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Institut für angewandte Festkörperphysik, Freiburg im Breisgau, West Germany). *Applied Physics*, vol. 14, Oct. 1977, p. 123-139. 23 refs.

A new principle for solar energy conversion is proposed and evaluated theoretically. Collection and concentration of direct and diffuse radiation is possible by the use of a stack of transparent sheets of material doped with fluorescent dyes. High efficiency of light collection can be achieved by light guiding and special design of collectors. The optical path length in a triangular collector is computed. In combination with solar cells this type of collector offers the advantage of separating the various fractions of light and converting them with solar cells with different bandgaps. Theoretical conversion efficiency under optimum conditions is 32% for a system with four semiconductors. An estimate of the economics of electricity generation shows that due to the concentration costs can be much lower than possible today. With the use of only silicon cells the breakeven point of \$0.5/W is almost reached. Practical difficulties to be solved are: Synthesis of dyes with stringent requirements, identification of plastic materials with high transparency and development of solar cells with higher bandgaps.

(Author)

**A77-49249** **Anik B, the new Canadian domestic satellite.** R. W. Hoedemaker (RCA, Astro Electronics Div., Princeton, N.J.) and D. G. Thorpe (Telesat Canada, Ottawa, Canada). *RCA Engineers*, vol. 23, June-July 1977, p. 80-84.

Data and descriptions are provided for the communications system and physical spacecraft layout and performance of the Anik B Canadian communications satellite. Anik B will be a dual-band satellite with two independent transponder subsystems, one operating in the 6/4-GHz bands, the other in the 14/12-GHz bands. Point-to-point voice, video, and data communications traffic between Canada's ten provinces and two territories will be facilitated by the satellite, which is a modification of the RCA Satcom system. Solar cells of greater efficiency and greater battery capability are expected to produce 140 W RF power throughout a 7-yr design life, including eclipse periods. TWTAs, coverage patterns, and multiplexers are described.

R D V

**A77-49348** **An off-peak energy storage concept for electric utilities. I - Electric utility requirements.** V. T. Sulzberger, Y. Z. El-Badry (Public Service Electric and Gas Co., Newark, N.J.), J. E. Clifford, and E. W. Brooman (Battelle Columbus Laboratories, Columbus, Ohio). *Applied Energy*, vol. 3, July 1977, p. 167-188. 24 refs. Research supported by the Battelle Columbus Laboratories.

A water battery was evaluated in an analytical and conceptual design study as a load-leveling system for an electric utility. The water battery produced hydrogen and oxygen by electrolysis of water during periods when off-peak electrical power was available. During peak demand periods, the water battery, operating in the reverse mode, functioned as a fuel cell by producing electrical power

through the recombination of the oxygen and hydrogen held in its storage vessels. Factors considered in the analysis include present and future energy requirements, current off-peak energy availability, typical sizing and placement of energy storage units, and the approximate break-even economics and potential advantages to the utility of a water battery energy storage system. In the cost effectiveness analysis, the water battery was compared with gas turbines and fuel cells.

M L

**A77-49349** **Ocean wave power.** I. Glendenning (Central Electricity Generating Board, Marchwood Engineering Laboratories, Southampton, England). *Applied Energy*, vol. 3, July 1977, p. 197-222. 31 refs.

The potential of wave power and some of the more promising methods of harnessing it are discussed with attention to the wave energy arriving on the west coast of the United Kingdom. Unresolved technical and engineering problems are examined, and the impact of wave power on the environment is considered. Data on wave power and its variability are supplied. It is suggested that wave power could be exploited to conserve fossil fuels but is unlikely to be competitive with nuclear power.

M L

**A77-49400** **Extraterrestrial resources and astronautics (Vnesheie resursy i kosmonavtika).** V. P. Burdakov and I. I. Danilov (Moscow, Atomizdat, 1976). 552 p. 853 refs. In Russian.

Papers are presented discussing the use of extraterrestrial materials and energy for powering spacecraft thrust equipment. Described are the thermodynamic parameters of earth, Mars, and Venus, earth's magnetic field and that of interplanetary space, and solar electromagnetic radiation. Various types of onboard storage cells are presented, along with onboard collectors of extraterrestrial resources. A classification scheme for energy converters is outlined, with attention to thermal and electromagnetic converters. Methods of creating thrust are reviewed as are analytical procedures for evaluating the effectiveness of spacecraft thrust systems.

S C S

**A77-49494** **MIS silicon solar cells with In2O3 anti-reflective coating.** H. Matsunami, S. Matsumoto, and T. Tanaka (Kyoto University, Kyoto, Japan). *Japanese Journal of Applied Physics*, vol. 16, Aug. 1977, p. 1491, 1492. 7 refs.

The electrical and optical properties of a solar cell with an In2O3-Pt-SiO2-nSi layered structure are studied. Experiments show that the open-circuit voltage of Pt-SiO2-nSi solar cells is increased by optimizing the thickness of the insulating layer. The short-circuit current and fill factor are also increased by an antireflective coating with transparent conductive In2O3 films. This solar cell has an efficiency of 8.8%, which represents a 127% increase. It is suggested that refinement of the formation of the insulating layer and the use of digitated electrodes will lead to an even higher efficiency.

M L

**A77-49575** **Prospecting for geothermal energy by geophysical methods.** R. Haenel (Niedersächsisches Landesamt für Bodenforschung, Hanover, West Germany). *Physics in Technology*, vol. 8, Sept. 1977, p. 213-218.

An assessment of methods used in prospecting for geothermal energy is presented. Three sources of geothermal deposits are identified: (1) areas of recent volcanism, (2) sediment basins, and (3) hot dry rock areas. After initial mapping of permeable and impermeable zones, any one of several techniques may be applied for a more thorough investigation of the subsurface. Descriptions of the following methods are included: aerial infrared surveys, geoelectrical investigation, geothermal measurements, explosion seismics, micro-earthquakes and ground-noise surveys, gravity studies, and airborne magnetic survey and geomagnetics. Data thus obtained may be used to construct a model of the subsurface and its thermal features, and economic studies can determine optimum sites for deep production wells.

S C S

**A77-49700** **Metallurgical evaluation of materials for geothermal power plant applications.** S. Toney, M. Cohen (General Electric Co., Medium Steam Turbine Dept., Lynn, Mass.), and C. J.



Cron (Union Oil Research Center, Brea, Calif.) *Geothermal Energy*, vol 5, Sept. 1977, p. 8, 9, 11-19 (17 ff.) 35 refs.

The chemical composition of geothermal steam at a New Mexico site is investigated with attention to its effect on the corrosion, stress-corrosion cracking, and fatigue endurance limits of turbine and heat exchanger materials. The test procedure is described with regard to equipment and materials, and evaluations of turbine and heat exchanger alloys. Conclusions based on field test programs and turbine experience with other nongeothermal contaminated atmospheres are presented. SCS

**A77-49745 # Georgia Tech high temperature solar test facility.** J D Walton, Jr (Georgia Institute of Technology, Atlanta, Ga.) In Symposium on Electromagnetic Windows, 13th, Atlanta, Ga., September 21-23, 1976, Proceedings Atlanta, Ga., Georgia Institute of Technology, 1977, p. 133-138 8 refs ERDA-sponsored research

The Georgia Institute of Technology Solar Thermal Test Facility, which involves a 400-kW solar furnace suitable for simulating aerodynamic heating of radomes, is described. Plans for the facility, scheduled to begin preliminary operation in 1977, call for an initial array of 550 circular mirrors made of low-iron window glass. Mechanical drive mounts for directing the concentrated solar energy to various test areas are also included in the planning. Calculations indicate that with maximum heat flux and concentration ratios, the solar furnace could provide a test area in which at least 175 kW of radiant thermal energy is available. Additional documentation of the facility is also mentioned. JMB

**A77-49753 International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings** Conference sponsored by the Institute of Electrical and Electronics Engineers. Edited by K R Rao (Texas, University, Arlington, Tex.). New York, Institute of Electrical and Electronics Engineers, Inc., 1976 192 p. Members, \$15, non-members, \$20

The papers deal with radioisotope thermoelectric generators (RTGs), thermoelectric (TE) materials and their properties, TE coolers, TE generators, novel TE devices, and TE heat-pump systems. Topics include recent terrestrial and undersea applications of RTGs, thermal optimization of small Pu-238-fueled RTGs, thermoelectric properties of Group I chalcogenides, quenching of thermoelectric Ge-Si alloys, a computer-aided design for a TE heat exchanger, and a numerical analysis of the transient behavior of TE coolers. Optimization of a TE generator design for fixed heat-input operation is also examined along with power-generating thermojunctions with radial current flow in coaxial disks, performance characteristics of a sodium heat engine, the overall efficiency of a solar collector that uses a Fresnel lens and a TE module to generate electrical power, an application of TE coolers as blackbody reference sources, and techniques for estimating heat loads on TE coolers. FGM

**A77-49988 # Investigation of the effective heat conductivity of metal-fiber wicks for low-temperature heat pipes (Issledovanie effektivnoi teploprovodnosti metallovoloknistykh fitilei nizko-temperaturnykh teplovykh trub)** M. G. Seniena and V. K. Zaripov (Kievskii Politehnicheskii Institut, Kiev, Ukrainian SSR). *Inzhenero-Fizicheskii Zhurnal*, vol. 33, Aug 1977, p. 255-262 16 refs. In Russian.

The experiments described were carried out to study the effective heat conductivity of wicks prepared from sintered copper, nickel, Nichrome, and stainless-steel fibers impregnated with methyl and ethyl alcohol, acetone, and distilled water. The monodisperse discrete fibers measured 20, 30, 40, 50, and 70 microns in diameter. The porosity of the wicks ranged from 10 to 96%. Test temperatures were between 16 and 35 C. The influence of such factors as porosity, fiber diameter, contact thermal resistance, and the heat conductivity of the liquids and fiber materials on the effective heat conductivity of the wicks was investigated. The heat transfer coefficients in the condensation zones of several low-temperature heat pipes employing metal-fiber wicks are calculated. V.P.

**A77-50050 Model calculations for metal-insulator-semiconductor solar cells** L C Olsen (Joint Center for Graduate Study, Richland, Wash.) *Solid-State Electronics*, vol 20, Sept 1977, p. 741-751 15 refs NSF Grants No AER-75-20501, No ENG-74-20444

An analytical approach to the calculation of MIS solar cell performance is developed. A model is constructed which accounts for three possible situations for the interface states in a MIS cell under illumination: (1) the interface states are in equilibrium with the metal, (2) they are in equilibrium with the majority carriers, or (3) they are in equilibrium with the minority carriers. It is assumed that the charged impurity concentration in the semiconductor is less than around 10 to the 18th power per cu cm. The interfacial region is assumed to be charge-free. The general conclusion is that the addition of an insulating layer between the metal and the semiconductor enhances the power conversion efficiency. PTH

**A77-50199 Thermal efficiency of solid electrolyte fuel cells with mixed conduction.** P N Ross, Jr and T. G. Benjamin (United Technologies Corp., Power Systems Div., South Windsor, Conn.) *Journal of Power Sources*, vol 1, Sept 1977, p. 311-321 16 refs. Research supported by the Electric Power Research Institute

The effect of mixed anionic and n-type electronic conduction in solid electrolytes on the thermal efficiency of a fuel cell system was analyzed quantitatively. The mixed conduction observed when electrolytes based on ceria are used in H<sub>2</sub>/air fuel cell applications lowers the maximum attainable cell thermal efficiency to below 40%. Neither the zirconia nor the ceria based solid oxide electrolytes studied to date can be used in a low temperature (700 C) system that meets simultaneously the requirements of power density and thermal efficiency for electric utility power plants. The material properties required for an advanced fuel cell power plant solid electrolyte were derived in terms of the ionic conductivity and the Schmalzried parameters. (Author)

**A77-50200 Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell.** J Ceynowa and R Wodzki (Torun, Uniwersytet, Torun, Poland) *Journal of Power Sources*, vol 1, Sept 1977, p. 323-331 20 refs

**A77-50201 Natural convection phenomena in inclined cells with finite side-walls - A numerical solution** W Koutsoheras and W W S Charters (Melbourne, University, Melbourne, Australia) (*International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug 1, 1975*) *Solar Energy*, vol 19, no 5, 1977, p. 433-438 5 refs

The effects of Rayleigh number, aspect ratio, and angle of inclination on the heat transfer through an inclined air cell are studied via the numerical solution of the relevant two-dimensional governing equations. This is done for two side-wall boundary conditions, namely, that of perfectly insulating and infinitely conducting side walls. In addition, the effects of a finite-thickness wall with a finite value of thermal conductivity is studied by solving the two-dimensional conduction equation in the wall and matching the values of temperature and heat flux at the common boundaries between the two regions. It is shown that the perfectly insulating and infinitely conducting boundary conditions are the two extremes of the real case and, depending on the values of the fluid parameters and the value of the wall thermal conductivity, the two fixed boundary conditions can be either accurate or inaccurate representations of the real case. A discussion of the relevance of this work to solar absorbers is included, with the major conclusion being that, depending on the aspect ratio of the cell used, cellular structures can be effective in reducing convective losses in inclined absorbers. (Author)

**A77-50202 On power-generating thermojunctions with radial flow of current** K Landecker (New England, University, Armidale, New South Wales, Australia) *Solar Energy*, vol 19, no. 5, 1977, p. 439-443. Research supported by the Australian Research Grants Committee

It was shown in a previous publication that in refrigerating thermocouples whose arms are in the form of coaxially arranged thermoelectric disks in which the current flow is radial, the effect of Joule heating on the performance is considerably reduced if the outer and inner radii of the disks are in the ratio of 4.5. It is now shown that if the same couples are used for the generation of power, the performance is enhanced in such a way that the internal resistance appears to be greatly reduced in magnitude. It is again found that disks with lateral boundaries in the form of hyperboloids have the most favorable shape. The thermojunctions described have been used mainly for research into utilization of solar energy.

(Author)

**A77-50203 \*** Hydrogen quantum yields in the 360 nm photolysis of  $\text{Eu}^{2+}$  solutions and their relationship to photochemical fuel formation. P. R. Ryason (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) *Solar Energy*, vol 19, no 5, 1977, p 445-448. 16 refs. Contract No. NAS7-100.

Water decomposition by a cyclic photoredox process is discussed in general terms. Thermodynamics determines the wavelength of the charge-transfer band corresponding to electron transfer to or from water of hydration of a cation. These relationships indicate that it is unlikely that a photoreduction reaction resulting in water decomposition will occur in the sea-level solar range of wavelengths. Such is not the case for photooxidation, and an example is known: the photolysis of  $\text{Eu}^{2+}$  in aqueous solution. Hydrogen quantum yields have been determined for this reaction. They are sufficiently high (about 0.3) as to offer encouragement for the further exploration of photoredox reactions as a means of solar energy conversion.

(Author)

**A77-50204** On the study of applications of solar thermal energy for mobile homes. J. P. Chiou (Detroit, University, Detroit, Mich.) *Solar Energy*, vol 19, no 5, 1977, p 449-466. 26 refs.

**A77-50205** Hydrogen production from water utilizing solar heat at high temperatures. T. Nakamura (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tanashi, Tokyo, Japan) *Solar Energy*, vol 19, no 5, 1977, p 467-475. 12 refs.

Possibilities of producing hydrogen and oxygen from water utilizing solar heat at high temperatures are investigated. The process of direct thermal decomposition of water is studied using a conceptual model. It is shown that the thermodynamic requirements for the direct thermal decomposer are difficult to realize from the structural viewpoint and that existing separation methods are not applicable for such a decomposition process if it is to attain sufficiently high thermal efficiencies. Feasibilities of realizing simple two-step thermochemical decomposition processes are investigated based on existing thermochemical data. It is predicted, as the results of thermochemical as well as thermodynamic analyses, that a two-step thermochemical decomposition process using iron oxide operates efficiently at relatively low temperatures attainable with solar heat and compatible with structural materials.

(Author)

**A77-50206** The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation. J. W. Bugler (Capricornia Institute of Advanced Education, Rockhampton, Australia) *Solar Energy*, vol 19, no 5, 1977, p 477-491. 12 refs.

**A77-50207** Heat transfer analysis of a flat-plate solar energy collector. G. Grossman, A. Shitzer, and Y. Zvirin (Technion - Israel Institute of Technology, Haifa, Israel) *Solar Energy*, vol 19, no 5, 1977, p 493-502. 13 refs.

A model is developed for the heat transfer in a flat-plate solar collector with a rectangular channel for water or air flow. This two-dimensional geometry offers the maximum area of contact between the fluid and the collecting surface exposed to the sun. The analysis yields temperature and heat-flow distributions in both dimensions of the collector. Thermal boundary layer development is

investigated. Overall efficiencies are calculated for uniform solar heat influx with variable heat losses from the plate. Thermosyphonic effect due to natural convection is evaluated, and the collector's geometry optimized with respect to this effect.

(Author)

**A77-50208** The use of functionalized polymers as photosensitizers in an energy storage reaction. R. R. Hautala, J. Little, and E. Sweet (Georgia, University, Athens, Ga.) *Solar Energy*, vol 19, no 5, 1977, p 503-508. 15 refs. NSF Grant No. CHE-75-13752, Contract No. E(38-1)-893.

Insoluble polymer-bound photosensitizers, useful for the conversion of norbornadiene (1) to quadricyclene (2), have been synthesized. An acetophenone analog was produced by Friedel-Crafts acylation of polystyrene resin, while treatment of chloromethylated resin with salicylaldehyde and triethylamine produced an analog of benzyloxybenzaldehyde. Reaction of lithio-polystyrene resin with methyl 4-(N,N-dimethylamino)benzoate gave a ketone equivalent to 4-(N,N-dimethylamino)benzophenone (3). Quantum yields for the conversion of 1 and 2 using the polymer-bound sensitizers were generally comparable to, but slightly lower than, the analogous compound in homogeneous solution. The quantum yield of polymer-bound 3 was less solvent dependent than that of the homogeneous counterpart. The advantages of isolating the photosensitizer to the photochemical reactor stage of a photochemical solar energy storage device are discussed. Efficient sensitization by polymer-bound photosensitizers demonstrates the feasibility of this approach.

(Author)

**A77-50209** A design procedure for solar air heating systems. S. A. Klein, W. A. Beckman, and J. A. Duffie (Wisconsin, University, Madison, Wis.) (*International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug. 1, 1975*) *Solar Energy*, vol 19, no 5, 1977, p 509-512. 9 refs.

A solar air-heating system incorporating a flat-plate air heater and packed-bed thermal storage is described, and a simulation model for the system is developed. The results of many simulations of the air-heating system are used to establish the relationship between system performance and the system design and meteorological variables. The results are presented in analytic and graphical form, referred to as an f-chart for solar air-heating systems. The results of simulations in several widely different climates suggest that the information presented in the f-chart is location independent. Methods of estimating the performance of air-heating systems having a collector air capacitance rate and a storage capacity other than those used to generate the f-chart are included. A comparison of the performance of air- and liquid-based systems is afforded by a comparison of their respective f-charts. The air system is shown to perform better at high load fractions supplied by solar energy than a liquid-based system with the same collector thermal-performance parameters.

(Author)

**A77-50210** Economics of solar heating with homeowner-type financing. R. L. Reid (Cleveland State University, Cleveland, Ohio), E. Lumsdaine (New Mexico State University, Las Cruces, N. Mex.), and L. Albrecht (Tennessee, University, Knoxville, Tenn.) *Solar Energy*, vol 19, no 5, 1977, p 513-517. 7 refs.

A feasibility study of the present-day economics of solar space and hot-water heating is presented for a region with Tennessee's climate and geographic latitude. The economics of solar systems is considered for typical cities across the state representing different weather conditions. Financing is considered for conditions likely to be encountered by a homeowner. These costs are compared with current fossil fuels and electric power systems, with graphs presented to aid in economic decisions.

(Author)

**A77-50212** The solar spectrum at typical clear weather days. K. W. Boer (Delaware, University, SES, Inc., Newark, Del.) *Solar Energy*, vol 19, no 5, 1977, p 525-538. 29 refs. Research supported by SES, Inc.

A number of typical clear-sky conditions are described which can be used for solar-collector calibration and general testing.

purposes. The spectral distribution of solar flux over the wavelength range from 300 to 1500 nm is given for the typical clear-weather days. Attention is focused on the air-mass-zero solar spectrum, effects of Rayleigh and Mie scattering, ozone and water-vapor absorption, and absorption due to other atmospheric molecules. Five model spectral distributions are presented which are reasonably close to the distribution of the direct solar component on certain clear-weather days. Scattered sky radiation is also taken into account along with solar irradiance at horizontal surfaces and the total irradiance on a surface normal to the direct solar component. F G M

**A77-50213**      **Solar energy and the residence - Some systems aspects** R C Neville (California, University, Santa Barbara, Calif.) *Solar Energy*, vol 19, no 5, 1977, p 539-548 16 refs

The feasibility, in an energy-flow sense, of providing heating, cooling, and electrical power for individual homes using some form of solar energy converter on the roof of each residence is considered. A model for home power requirements and solar insolation which reflects residence construction, local weather, and geographic location is developed. This is used to demonstrate that 50-90% of the homes in the USA could be self-powered from solar energy, provided sufficient insulation is used and adequate energy-conversion techniques are developed. (Author)

**A77-50214**      **The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors** R B Bannerot and J R Howell (Houston, University, Houston, Tex.) (*International Solar Energy Society, International Solar Energy Congress and Exposition, Los Angeles, Calif., July 28-Aug 1, 1975*) *Solar Energy*, vol 19, no 5, 1977, p 549-553 11 refs NSF Grants No G1-41003, No AER-73-03357-A01, Contract No E(40-1)-5100

**A77-50218**      **A note of the economics of deep cylindrical mirror concentrating collectors** H Tabor (Jerusalem, Hebrew University, Jerusalem, Israel) *Solar Energy*, vol 19, no 5, 1977, p 573, 574 5 refs

A design program for creating cost-effective cylindrical parabolic reflectors for use in solar concentrating collectors is discussed. The program takes into account the geometry of the cylindrical mirrors in defining the maximum optical concentration obtainable with minimum usage of materials. Sample problems dealing with two kinds of thermal collector systems, one in which the primary cost is for the energy converter and a second in which the basic cost is relatively low, are given. Other factors affecting the design of a collector system, including the necessity for periodic adjustment of the mirror tilt, are also mentioned. J.M.B

**A77-50219**      **Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces** M van der Leij and C J Hoogendoorn (Delft, Technische Hogeschool, Delft, Netherlands) *Solar Energy*, vol 19, no 5, 1977, p 575-577 10 refs.

A commercially available solar simulator was used to study the effect of the direct spectral solar energy distribution on the normal total absorptivity of several spectral-selective surfaces. The surfaces analyzed included Co<sub>3</sub>O<sub>4</sub> on nickel, black chrome on nickel, oxidized copper and oxidized steel number 37. Reflectivities and emissivities for the spectral-selective surfaces, recorded under conditions of air mass number equal to two, were employed to compute normal total absorptivities; the computed data were compared to published standards. It was found that for practical engineering purposes the simple solar simulator, which has a continuous spectral curve, could provide an adequate model of the performance of the spectral-selective surfaces. J M B

**A77-50220**      **The dependence of current output of the Ti-TL SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on photostationary state composition** P D Wildes, K T Brown, M Z Hoffman, N N Lichtin (Boston, University, Boston, Mass.), and D E Hall (Exxon Research and Engineering Co., Linden, N.J.) *Solar Energy*, vol 19, no 5, 1977, p 579-582 24 refs NSF Grant No AER-72-03579

Photostationary state compositions of totally illuminated thin-layer iron-thionine solutions applicable to photogalvanic cells were determined for a number of illumination intensities. The photo-reduction of thionine in the illuminated solutions was measured spectrophotometrically by means of the cross-illumination technique. An alternate method of measurement involving calculations based on photochemical reaction equations is also considered. In addition, short-circuit currents in SnO<sub>2</sub>/Pt photogalvanic cells containing the iron-thionine solutions were monitored. A simple diffusion model is applied to account for the linear relationship between photostationary composition and the current output of the cells. It is concluded that a totally illuminated cell having an effective diffusion length of 25 microns and containing a specified concentration of leucothionine may convert solar light in the thionine band to electrical current with 100% efficiency. J M B

**A77-50221**      **Effect of angular misorientation on the performance of conical, spherical and parabolic solar concentrators** N E Wijesundera (University of Sri Lanka, Peradeniya, Sri Lanka) *Solar Energy*, vol 19, no 5, 1977, p 583-588 6 refs

**A77-50223**      **Fundamental research on heat transfer performances of solar focusing and tracking collector** Y Mori, K Hijikata, N Himeno (Tokyo Institute of Technology, Tokyo, Japan), and W Nakayama (Hitachi, Ltd., Mechanical Engineering Research Laboratory, Tsuchiura, Japan) *Solar Energy*, vol 19, no 5, 1977, p 595-600 7 refs

The components and performance of a focusing solar energy cylindrical collector system are described. The mirror is parabolic in cross section with a 50 mm focal distance and is 900 mm long. The absorbing pipe is made of copper and has a black oxidized surface which was lined with grooves to increase the absorption; the procedure for producing grooves is explained. A discontinuous tracking device was designed to detect the direction of the sun by means of a system of five phototransistors, two of high sensitivity and sharp directional characteristics, and three of low sensitivity and wide directional characteristics. The construction and circuitry of the tracking device are examined. The tracking device operates with an accuracy of 0.05 deg. Performance characteristics of the solar energy system are evaluated. M L

**A77-50255**      **A technical scale gas generator for steam gasification of coal using nuclear heat** H Juntgen and K H. Van Heek (Bergbau-Forschung GmbH, Essen, West Germany) *Nuclear Technology*, vol. 35, Oct 1977, p 581-590 13 refs. Research supported by the Bundesministerium für Forschung und Technologie.

A fluidized bed coal gasifier into which the reaction heat is transferred from a gas-cooled high-temperature nuclear reactor (HTR) is described. New alloys based on Incoloy 800 will meet the specifications required for the heat exchanger. A technical scale gasifier will process about 50,000 kg of low volatile bituminous coal/h at 40 bar (4 MPa). Such HTR parameters as helium outlet and inlet temperatures, such coal parameters as ash and water content or reactivity, and other parameters exert an impact on operating data of a combined plant consisting of an HTR and a gas plant. (Author)

**A77-50281**      **Optical properties of selectively absorbing Ni<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> composite films** H G Craighead and R A Buhrman (Cornell University, Ithaca, N.Y.) *Applied Physics Letters*, vol 31, Oct. 1, 1977, p 423-425, 6 refs NSF-ERDA-supported research

Composite films of Ni particles embedded in an Al<sub>2</sub>O<sub>3</sub> matrix have been produced by controlled coevaporation. The optical properties of the Ni/Al<sub>2</sub>O<sub>3</sub> composites measured over the range of the solar spectrum are in good accord with the predictions of Maxwell-Garnett (1904) theory, provided the Ni volume fraction is no more than about 0.2. The composite films have excellent spectral selectivity for the absorption of solar radiation, with a solar absorptivity of 0.94 obtained for a film produced with a composition gradient. Low-temperature emissivities of approximately 0.1 have

been obtained with composite films evaporated on highly reflecting metal substrates (Author)

**A77-50287** N-CdS/n-GaAs voltage-enhanced photoanode S Wagner and J L Shay (Bell Telephone Laboratories, Inc., Holmdel, N J) *Applied Physics Letters*, vol 31, Oct 1, 1977, p 446, 447 8 refs

The letter reports an n-CdS photoanode grown on an n-GaAs substrate. The photovoltage at the n-GaAs/n-CdS junction in series with the CdS/electrolyte junction increases the solar-cell efficiency by a factor of about 1.5 relative to a simple n-CdS photoelectrochemical solar cell (Author)

**A77-50292** Efficient sprayed In<sub>2</sub>O<sub>3</sub> Sn n-type silicon heterojunction solar cell J C Manificier and L Szepessy (Montpellier II, Université, Montpellier, France) *Applied Physics Letters*, vol 31, Oct 1, 1977, p 459-462 15 refs

Results are presented concerning an In<sub>2</sub>O<sub>3</sub> (tin-doped) n-type silicon heterojunction solar cell. The transparent and conductive In<sub>2</sub>O<sub>3</sub> Sn layer was made using a very simple, cheap, and quick method. Conversion efficiency up to 10 percent is reported. Typical parameters under AM1 simulated sunlight are an open-circuit photovoltage of 500 mV, short-circuit photocurrent of 32 mA/sq cm, and fill factors around 0.6-0.65 (Author)

**A77-50293** Enhancement of diffusion length in EFG ribbon solar cells under illumination C T Ho, R O Bell, and F V Wald (Mobil Tyco Solar Energy Corp., Waltham, Mass.) *Applied Physics Letters*, vol 31, Oct 1, 1977, p 463-465 6 refs

The short-circuit current, efficiency, and minority-carrier diffusion length of EFG (edge-defined film fed grown) ribbon silicon solar cells have been measured as a function of illumination level between 0 and 5 suns and found to increase. The faster rate of increase of the current in ribbon cells as compared with silicon crystals grown by the conventional Czochralski method is attributed to the enhancement of the minority-carrier diffusion length under illumination. A quasi-continuous deep-trap model with a Gaussian distribution of compensated donor states is proposed to account for these observations (Author)

**A77-50295** Cast polycrystalline silicon Schottky-barrier solar cells D R Lillington and W G Townsend (Royal Military College of Science, Shrivenham, Wilts., England) *Applied Physics Letters*, vol 31, Oct 1, 1977, p 471, 472 9 refs

Measurements have been made of the electrical and optical properties of polycrystalline metal-insulator-semiconductor Schottky-barrier solar cells formed by the evaporation of aluminum onto Wacker-Silco cast p-type silicon substrates. Results show that consistently high efficiencies under standard illumination conditions may be achieved using this material and that the voltage-current characteristics are stable over the period of testing. The short-circuit current of these devices (about 22 mA per square cm) indicates that grain-boundary recombination is not a serious problem (Author)

**A77-50350** RF oscillations of a plasma in crossed E x H fields. V T Karpukhin and P G Leonov (*Pis'ma v Zhurnal Tekhnicheskoi Fiziki*, vol 2, Dec 12, 1976, p 1084-1086) *Soviet Technical Physics Letters*, vol 2, Dec 1976, p 427, 428 Translation

Experiments were performed to study a helium-caesium discharge in a transverse magnetic field (in MHD generator conditions) in the following conditions: a helium pressure of 5-100 torr, a caesium pressure of 0.01-0.05 torr, a current density of 0.5-5 amps/sq cm, and a magnetic field strength of 0.7 kG. The longitudinal and Hall components of electric field in the plasma were measured and electron temperature and density were determined from the intensity of the recombination continuum of caesium. The dependence of the intensity of high frequency (in the range 80-100 MHz) oscillations on magnetic field was studied B J

**A77-50433** A large conventional MHD magnet J M Tarrh (Magnetic Engineering Associates, Inc., Cambridge, Mass.) *Institute of Electrical and Electronics Engineers, International Magnetism Conference, Los Angeles, Calif., June 6-9, 1977* *IEEE Transactions on Magnetism*, vol MAG 13, Sept 1977, p 1562-1564

A description is presented of a transverse field conventional electromagnet which has been designed and constructed to satisfy the requirements of a large private firm engaged in MHD research. The electromagnet has provided a peak central magnetic field of 4.2 T across a 0.267 m gap. The test data demonstrate that water-cooled hollow copper conductors can be used to produce high magnetic fields continuously over large volumes, without requiring extravagant amounts of materials of power. This is achieved without the complexity required by cryogenic or superconducting systems. Attention is given to details of electromagnetic design, aspects of mechanical design, and thermal design considerations G R

**A77-50499** Assuring the performance of fossil energy programs S S Canja (ERDA, Washington, D C) In *Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 18-20, 1977, Proceedings* Piscataway, N J, Institute of Electrical and Electronics Engineers, Inc., 1977, p 421-426

In an effort to achieve timely commercialization, ERDA/Fossil Energy has developed the Performance Assurance System (PAS), a technique for reducing uncertainties in the economics of proposed processes and improving plant and component operability. PAS aids the decision making functions of ERDA program managers and industrial contractors through systematic application of standardized data collection and exchange procedures, analytical methods, mathematical models and information transfer techniques. This paper reviews the status of PAS, emphasizing objectives, approach, benefits, and implementation B J

**A77-50651** Development of a turbine rotor of silicon nitride P Walzer, M Langer, and J Siebels (Volkswagenwerk AG, Wolfsburg, West Germany) *(U.S. Army Materials and Mechanics Research Center, Materials Technology Conference on Ceramics for High-Performance Applications, 5th, Newport, R I., Mar 21-25, 1977)* *Zeitschrift für Werkstofftechnik*, vol 8, Sept 1977, p 294-299. Research supported by the Bundesministerium für Forschung und Technologie

Gas turbines could potentially provide automobiles with power plants having very low pollutant emissions. However, at current operational temperatures gas turbines are not competitive with conventional power plants. A realization of the potential of the gas turbine for reducing automobile-related air-pollution levels depends, therefore, on the development of gas turbine components made of materials which will permit the elevation of the operational temperatures of the turbine to the required levels. A description is presented of a program designed to develop gas turbine components made of ceramics, giving particular attention to the use of silicon nitride. The fabrication of a multidensity rotor is discussed, taking into account the strength of prototype rotors, the thermal shock resistance of the components, and the oxidation resistance of the materials. G R

**A77-50688** Solar energy A U K assessment Research sponsored by the International Solar Energy Society and Wolfson Foundation London, International Solar Energy Society, 1976 379 p 271 refs \$17.40

Solar energy systems under development in the United Kingdom are discussed, with attention given both to domestic systems, which may supply 10 to 20% of the national energy needs, and to equipment designed for export. Studies presented address such technological and theoretical questions as spectral irradiance measurement techniques, diurnal variations in solar radiation, solar simulation methods, thermal performance of flat-plate collectors, energy storage techniques, solar cell design and the photochemical conversion of solar energy. Investigations of solar space heating applied to UK environments, agricultural applications of solar

energy, capital costs for solar water heating systems, a comparison of diesel and photovoltaic electric generation costs, nitrogen fixation by photosynthetic systems, reductive fixation of carbon dioxide and the photochemical decomposition of water are also reported J M B

**A77-51023\*** Where do we locate the moon base. J D Burke *Spaceflight*, vol 19, Oct 1977, p 363-366 14 refs Contract No NAS7-100

Because the lunar polar regions permit continuous solar energy collection and adjacent cryogenic temperature, they may be the preferred sites for early human occupation and use of the moon. If permafrost exists in the polar shaded regions, this preference will become dominant. Though not ideal from the point of view of all-sky coverage for astronomical observations, and also possibly subject to terminator-plane particle hazes near the surface, polar sites (especially the south polar region) may offer enough advantages (e.g., constant cryogenic telescope environments and unlimited tracking time) to be preferred sites for the first lunar observatories B J

**A77-51126** Power generation Air pollution monitoring and control Edited by K E Noll (Illinois Institute of Technology, Chicago, Ill.) and W T Davis (Tennessee University, Knoxville, Tenn.) Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976 563 p. \$27.50

An engineering guide for predicting dispersion of emissions is provided and aspects related to the monitoring of power plant emissions are considered, taking into account a simplified technique used to evaluate atmospheric dispersion of emissions from large power plants, the estimation of downwash effects, the design of air monitoring surveys near large power plants, airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station, a calibration procedure for continuous air monitoring instruments, the sampling and analysis of trace metals in the atmosphere, and the monitoring of industrial sulfur scrubbers by flame photometry. Attention is also given to intermittent control systems for sulfur dioxide, the removal of sulfur dioxide from stack gases, and the control of particles from power generation G R

**A77-51128** Eliminate source emission codes for coal-refuse fired power plants. F A Brunner (Sverdrup and Parcel and Associates, Inc., St. Louis, Mo.) In *Power generation Air pollution monitoring and control* Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976, p 29-33 9 refs

An investigation is conducted regarding the feasibility of an implementation of proposals related to the conversion of coal-fired, steam-electric power plants to operate on both municipal refuse and coal. Operational problems concerning such a conversion are partly related to an increase in the storage space required. The storage space needed for refuse is about five times as large as the space required for coal. Attention is given to differences in the ash content of coal and refuse, methods of handling the associated waste from the conversion, and separate emission regulations for dual-fuel power plants established by some states. It is proposed to eliminate the risk of halting operation due to exceeding state emission standards and to give recognition to existing plant limitations by testing each anticipated fuel-converted plant solely according to the limits of the ambient air standards in each specific area plant setting G R

**A77-51135** Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station. N T Stephens (Virginia Polytechnic Institute and State University, Blacksburg, Va.), A. N. Bird, Jr., and J D. McCain (Southern Research Institute, Birmingham, Ala.) In *Power generation Air pollution monitoring and control* Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976, p 153-168 7 refs. Research supported by Southern Services

**A77-51144** Status of sulfur dioxide removal systems for the electric utility industry. T. W. Devitt and T. C. Ponder, Jr

(PEDCO-Environmental Specialists, Inc., Cincinnati, Ohio) In *Power generation Air pollution monitoring and control*.

Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976, p 307-317

The current state of the art of flue gas desulfurization (FGD) technology in the U.S. is evaluated. Fourteen of the 21 FGD systems on utility size boilers which were in operation on Feb. 1, 1975, were based on a use of lime or limestone. Two systems used a magnesium oxide scrubbing process, two employed sodium carbonate, two utilized a double alkali procedure, and one made use of catalytic oxidation. The reliability and availability of FGD systems is considered and an operating summary for FGD systems is presented. A brief description is provided of the results of studies which have evaluated the cost of controlling the particulate and sulfur dioxide emissions from utility boilers G R

**A77-51146** Flue gas desulfurization by fly ash. H I Zeliger In *Power generation Air pollution monitoring and control* Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976, p 379-390 11 refs

A summary is presented of the chemistries of 11 flue gas desulfurization (FGD) processes and a description is provided of the results of a study concerned with the selection of an FGD process for a power station which uses as fuel a low-sulfur lignite which is site-specific. The selected fly ash/lime process is discussed, giving attention to the absorber gas system, the absorber-recycle system, the reagent system, the disposal recycle system, the clarifier system, and the overall material balance G R

**A77-51148** Electrostatic precipitator design for western coals. W A Baxter (Environmental Elements Corp., Baltimore, Md.) In *Power generation Air pollution monitoring and control*

Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976, p 415-425 6 refs

The vast reserves of strippable low-sulfur coal contained in the 17 western states can possibly provide the utility industry with a substantial part of the fuel needed for its operation. However, the specific properties of this coal will make it necessary to modify equipment originally designed for eastern and mid-western fuels. An overview is presented of the techniques in use today to adapt electrostatic precipitator design for the reliable high-efficiency collection of the fly ash emanating from the burning of western coals. Attention is given to the precipitation process, high acceleration rapping, high temperature operation, low temperature operation, conditioning, wet precipitation, and precipitation specification G R

**A77-51152** Air pollution control for industrial coal-fired boilers. A H Jones (Joy Manufacturing Co., Los Angeles, Calif.) In *Power generation Air pollution monitoring and control*

Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1976, p 529-542

The role that sulfur plays in the burning of fossil fuels is examined and a description is presented of the design and the principles of operation of an electrostatic precipitator which separates dust, fume, or mist from a gas stream by exposing the stream to a high voltage field. Cloth baghouses are discussed, taking into account the use of woven cloth, needled felt, glass in the fabric, reverse flow glass fabric filters, shaker-type glass baghouses, and pulse jet-type filters. Cyclonic collectors and wet scrubbers are also considered and attention is given to equipment costs and questions of sulfur dioxide removal G R

**A77-51153** Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements (Wege zum rationalen Energieverbrauch, gezeigt am Beispiel des Schienenverkehrs und des Niedertemperaturwärmebedarfs). K Bauermeister (Deutsche Bundesbahn, Frankfurt am Main, West Germany), C Brecht (Ruhrgas AG, Essen, West Germany), H Schaefer (München, Technische Universität, Munich, West Germany), and B Stoy (Rheinisch-Westfälisches

Elektrizitätswerk AG, Essen, West Germany) *Brennstoff-Wärme-Kraft*, vol. 29, Sept 1977, p. 347-352. In German

An improvement of the efficiency of processes involved in obtaining, converting, distributing, and employing energy makes it possible to lower specific energy requirements. An improvement of this efficiency implies in most cases that expenses for increased capital investment take the place of a part of the costs for energy. The economic aspects of such a replacement improve with increases in the cost of fuel. Savings related to lower expenditures for environmental protection in connection with lower energy consumption must also be taken into consideration. Attention is given to heat conservation approaches employed in the case of new houses and buildings in West Germany, the utilization of solar radiation, the reduction of the heat losses of hot-water storage, the employment of heat pumps, an extended use of electric locomotives, the use of natural gas in gas heat pumps, and various approaches leading to a minimization of traffic-related energy requirements. G.R.

**A77-51154** Improvements in energy conversion technology (Verbesserungen in der Energieumwandlungstechnik). K. Knizia, G. Hirschfelder, D. Schwarz, and K. Weinzierl (Vereinigte Elektrizitätswerke Westfalen AG, Dortmund, West Germany). *Brennstoff-Wärme-Kraft*, vol. 29, Sept 1977, p. 353-360. In German

Requirements concerning an improvement of the processes and techniques employed in connection with energy-consuming applications are related to the need to enhance the efficiency of energy utilization and to environmental-protection considerations. The necessity to replace fuels in short supply with other forms of energy is also an important factor. Developments related to an improvement of conventional processes are examined, taking into account an enhancement of steam-turbine efficiency, the significance and the processes of coal gasification, and factors which affect the efficiency of coal gasification installations. Problems and possibilities regarding a use of nuclear installations are also evaluated. The vast expenditures required for the development of new systems are only justified in the case of great qualitative advantages. Such advantages are provided by the fast breeder and the high-temperature reactor. G.R.

**A77-51155** Combined heat and electricity generation as a means for saving primary energy (Kombinierte Wärme- und Elektrizitätszeugung als Weg zur Primärenergieeinsparung). H. Schulte. *Brennstoff-Wärme-Kraft*, vol. 29, Sept 1977, p. 366-370. In German

It is pointed out that the energy losses in energy-conversion processes in West Germany are about 67%. An investigation is conducted regarding the approaches which can be used to reduce these losses. Energy currently lost in connection with the conversion of fossil and nuclear primary energy into electric energy can be utilized for space heating applications, which, in West Germany, consume about 40% of the total amount of primary energy used. Approaches for implementing methods involving such a utilization are discussed, taking into account details of heat transfer, the transportation of the heat from the power plant to the location where it is used, and questions concerning the required investment costs. A description is presented of a project designed to demonstrate the feasibility of the considered concepts. The construction costs for the required installations are about 175 million DM. G.R.

**A77-51156** The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology (Die zukünftige Bereitstellung von flüssigen und gasförmigen Kohlenwasserstoffen durch Vergasung von Kohle und die langfristigen Aussichten für eine Wasserstofftechnologie). W. Peters (Steinkohlenbergbauverein, Essen, West Germany), R. Schulten (Kernforschungsanlage Jülich GmbH, Jülich, West Germany), and P. Speich (Rheinische Braunkohlenwerke AG, Cologne, West Germany). *Brennstoff-Wärme-Kraft*, vol. 29, Sept 1977, p. 371-376. 21 refs. In German

**A77-51157** Development of new technologies for energy production in the Federal Republic of Germany (Entwicklung neuer

Technologien zur Energieerzeugung in der Bundesrepublik Deutschland). W.-J. Schmidt-Kuster and H. F. Wagner (Bundesministerium für Forschung und Technologie, Bonn, West Germany). *Brennstoff-Wärme-Kraft*, vol. 29, Sept 1977, p. 377-383. In German

The development of new energy technologies is necessary to assure the medium-term and long-term supply of the economy with energy and to aid the countries of the third world in solving their energy problems. Nuclear energy represents currently for West Germany the only available new technology that has the potential to provide energy which can replace on a short-term or medium-term basis a significant part of petroleum-related fuels. An enhanced utilization of coal and lignite reserves requires the development of new conversion technologies which are costwise and with respect to environmental considerations acceptable. A number of difficulties will have to be overcome before an economic use of solar energy for space-heating and hot-water supply applications will be possible. Attention is also given to developments and prospects concerning the utilization of solar energy in its various forms for other applications, technologies for a more efficient use of energy, and studies concerning controlled nuclear fusion. G.R.

**A77-51161** Optical study of fixed spherical solar collectors (Etude optique des capteurs solaires sphériques fixes). B. Authier (CNRS, Laboratoire d'Astronomie Spatiale, Marseille, France). *Journal of Optics*, vol. 8, Sept-Oct 1977, p. 331-337. 6 refs. In French

A procedure is developed for finding radiation (sunlight) incident along the sagittal line of a spherical solar collector. The analysis is developed on the basis of geometric optics, for the cases point source on the mirror axis at infinity, single or multiple reflections, point source off axis at infinity, mobile mirror elements. The amount of radiation intercepted is increased via addition of a sun-tracking mobile mirror element, termed boresight ('visière'), under tropical insolation conditions. R.D.V.

**A77-51169** General Electric prepares the LM5000 for testing. *Gas Turbine International*, vol. 18, July-Aug. 1977, p. 52, 53

The LM5000 dual rotor industrial gas generator is described, along with its full-scale testing program. The single-stage low-pressure turbine for the low-pressure compressor and the two-stage high-pressure turbine for the high-pressure compressor and the annular combustor are described briefly. The LM5000 design is derived from the CF6-50 commercial aviation turbofan engine. Major modules are completely replaceable subsystems. The LM5000 is rated at 40,000 to 60,000 isentropic gas horsepower. R.D.V.

**A77-51256** On pressure-work, viscous dissipation and the energy balance relation for geothermal reservoirs. S. K. Garg and J. W. Pritchett (Systems Science and Software, La Jolla, Calif.). *Advances in Water Resources*, vol. 1, Sept 1977, p. 41-47. 11 refs. NSF Grant No. ENV-75-14492-A01

This article examines the conditions under which the pressure-work and viscous dissipation terms should be retained in the energy balance relation for single (liquid water or vapor) and two-phase (liquid water and vapor) fluid flow through porous media. It is shown that if one wishes to retain the pressure-work term, then one must also keep the viscous dissipation term in the energy balance. Consideration of steady non-isothermal radial flow demonstrates that both pressure-work and viscous dissipation are liable to have negligibly small effects in single phase liquid water and in two-phase liquid-vapor systems. This conclusion is, however, not generally valid for pure vapor systems, in this case, pressure-work and viscous dissipation can produce significant variations in the computed reservoir response. (Author)

**A77-51257** A comparison between experimental and numerical investigations of the motion of the water surface in a model surge tank. P. W. France (University of Wales Institute of Science and Technology, Cardiff, Wales). *Advances in Water Resources*, vol. 1, Sept. 1977, p. 49-51

This paper describes an investigation into the motion of the water surface in a simple model surge tank, and the relevant factors governing its behaviour. The oscillation of the free water surface is an unsteady flow problem, which is amenable to a mathematical solution using a finite difference step-by-step integration procedure. For comparison, two such methods are presented (1) a simple initial value method and (2) a predictor-corrector technique. Computer programs have been developed linked to a graph plotter to give a visual presentation of the numerical solutions together with the experimental results of the damped oscillation of the water surface in the model surge tank. (Author)

**A77-51279** Water and energy systems - A planning model  
E D Brill, Jr, S G Velioglu, and R W Fuesle (Illinois, University, Urbana, Ill.) *American Society of Civil Engineers, Water Resources Planning and Management Division, Journal*, vol 103, May 1977, p 17-32. 22 refs. Research supported by the U S Department of the Interior.

The implementation of plans regarding the utilization of the vast coal reserves in the Ohio River Basin area in connection with the need for a replacement of petroleum-derived fuels and natural gas would require the use of large quantities of water. In considering the withdrawal of the required water, attention must be given to other existing and potential demands for the water resources, including, in particular, the water currently used for electricity generation. An investigation is conducted regarding the relationships and interactions between the various water-consuming systems. The investigation makes use of a planning model which is to serve as a tool for evaluating some aspects of the major policy issues in a large region such as a state. The components, constraints, and limitations of the model are discussed. (Author)

**A77-51284** Pumped storage optimization in generation systems  
J S Windsor (Natal, University, Durban, Republic of South Africa) *American Society of Civil Engineers, Water Resources Planning and Management Division, Journal*, vol 103, May 1977, p 99-109. 7 refs.

An investigation is conducted regarding some of the economic fundamentals which have to be considered in power system planning. A description is presented of a form of mixed integer programming which can be used to determine the optimal planning policy for an expanding electric power system, with special reference to the integration of pumped-storage schemes into the overall system. Mathematically, the problem is a dynamic nonconvex programming problem in which the nonconvexities are caused by economies of scale associated with the cost of building and operating the power facilities. (Author)

**A77-51366** Technical, economic, and environmental evaluation of in situ coal gasification  
T F Edgar (Texas, University, Austin, Tex.) *In Situ*, vol 1, no 1, 1977, p 75-102. 11 refs. Research supported by the Atlantic Richfield Co, Continental Oil Co, Dow Chemical Co, Du Pont de Nemours and Co, Enserch, Mobil Oil Corp, Shell Oil Co, Texas Utilities and NSF.

Underground coal gasification is a process which should be considered as a competitor on an economic basis with shaft mining of coal. However, not all coal seams and locations are viable candidates for the application of this technology. The important factors in site evaluation, including coal properties, geological conditions, and operating parameters, as well as the economics of underground coal gasification, are discussed. Specific reference to the Soviet system of underground gasification is given. (Author)

**A77-51370** Heating with solar energy (Le chauffage par l'énergie solaire)  
M Caratsch (Sulzer Frères, S A, Division Chauffage et Climatisation, Winterthur, Switzerland) *Revue Technique Sulzer*, vol 58, no 4, 1976, p. 151-157. In French.

The article describes and compares several types of solar cell panels and heat storage units, conditions favoring profitable exploitation of solar energy (economic, meteorological), and describes some existing solar energy installations. Effects of water vapor content and

dust loading of air, rural air, misty and foggy weather, daily variations of direct and diffuse sunlight, and seasonal variation of insolation are described and plotted. Single-pane and double-pane solar cell panels and their performance are compared for various temperature differences and monthly-average insolation data. Rural and urban use of solar energy for space heating and cooling, and for hot water supplies, are considered. (Author)

**A77-51372** Hydrogen absorption in Ti3Al  
P S. Rudman (Technion - Israel Institute of Technology, Haifa, Israel), J J Reilly, and R H Wiswall (Brookhaven National Laboratory, Upton, N Y.). *Bunsen-Gesellschaft für Physikalische Chemie, Berichte*, vol 81, Jan 1977, p 76-80. 10 refs. ERDA-sponsored research.

The reported investigation had the objective to study the effect of aluminum on the fundamental thermodynamic parameters of hydrogen absorption in Ti in connection with the potential significance of Ti based alloys for hydrogen storage applications. Typical absorption/desorption isotherms for hydrogen in Ti3Al at temperatures of 450, 550, 650, and 750 C for the hydrogen dissociation pressure range from 0 to 1000 Torr are presented in a graph. The obtained results are compared with data for pure Ti compiled by Gallagher and Oates (1969). The effect produced by Al appears to be interpretable as the blocking of interstitial sites from hydrogen occupancy. (Author)

**A77-51390** Past experience - Basis for future advanced power systems for communications satellites  
B Gohrbandt and J Rath (Telefunken AG, Wedel, West Germany) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-22*. 18 p. 5 refs.

Multi-kilowatt solar power systems for advanced communications satellites are discussed. Solar generators with foldable or roll-out blankets and power outputs of 20 kW or greater are described, the power/mass ratios for various configurations of the flexible solar generators are compared. Problems associated with solar arrays, such as high initial power outputs and subsequent degradation, the need for advanced nickel-cadmium and nickel-hydrogen storage batteries, and charging of the solar generators by the plasma environment, are also mentioned. Modular design of booms, actuators and solar array blankets, as well as development of pulse-width-modulation shunt regulators and a c power distribution systems for satellite applications are considered. (Author)

**A77-51411** Studies of technological processes by solar energy under cosmic simulated conditions  
I N Frantsevich, V I Trefilov, V S Dverniakov, V V Pasichny, and I E Kasich-Pilipenko (Academy of Sciences, Intercosmos Council, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-54*. 7 p. 5 refs.

Welding was studied in the SGI-5 solar furnace heated with the aid of a 2-m-diameter parabolic mirror. The radiant flow ranged from 150 - 1900 W/sq cm. The effects of radiant flow efficiency, process speed, and joint type on the size and shape of the weld pool were studied. Various alloys in the form of 0.25 - 2.0-mm-thick flat plates (or cylinders) with weld joints were used, and solders are described. The appearance and properties of the welds are reported and compared with welds obtained by more common procedures. The results can be applied to the development of solar energy welding techniques which can be used in the low-gravity environment of space. The desirable features of welds formed in such an environment are summarized. (Author)

**A77-51415** Space power stations - Space construction, transportation, and pre-development, space project requirements.  
R Piland (NASA, Johnson Space Center, Houston, Tex.) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-64*. 45 p. 9 refs.

Several features of solar energy space power stations are discussed. An end-to-end analysis of a system using silicon solar cells is reviewed, and the merits of construction in low earth orbit and in geosynchronous orbit are compared. A suggested space construction procedure, described in detail, would use a 'beam builder', an automated machine, to fabricate the first sublevel truss structural members from strip stock material that is stored on reels. An assembly jig would then be used to position a number of beam builders in the proper location and to support the beams as they are produced to facilitate joining them to form the final space power station structure. Space projects for evaluating the construction concept are proposed, and a possible space construction sequence is considered. Space transportation that would be required in conjunction with the space power station is described. M L

**A77-51416** Composites for large space structures J. F. Garibotti, R. J. Reck, and A. J. Cwiertny (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper 77-65* 37 p 12 refs

The use of graphite-polyimide or graphite-epoxy truss beams, panels and tubing in large space structures, such as solar power satellites, multibeam lens antenna systems or parabolic radiometers, is discussed. Advantages of the advanced composites, including a high degree of stiffness, good thermal stability, as well as high packaging density for the trip to orbit, are considered. The design of truss elements and joints is studied, and fabrication techniques, such as pultrusion, braiding and chopped-fiber molding (for joints), are compared. Contamination of the composites due to inert gases, lubricants or toxic volatiles from cleaning solutions, is also considered. J M B

**A77-51431** Experimental research of oscillations in the discharge gap of plasma accelerator. V. P. Shadov and K. V. Evdokimov (Academy of Sciences, Intercosmos Council, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper 77-104* 7 p.

The amplitude-frequency performance of plasma accelerators in the discharge gap are studied with attention to the electromagnetic oscillations originating in the main and near-electrode zone, the potential oscillations in these zones as well as their spatial-time distributions, and the supply circuit electric oscillations at transient conditions which depend on the discharge current, working fluid flow rate, and cathode temperature. A lithium plasma accelerator with tungsten electrodes was used in this study. An autocorrelative function of the fluctuations provides information on the mean spectrum frequency and the mean wave vector over the correlative function period, and the directions of propagation and the mean phase velocity of oscillations. The implications of experimental data are discussed. M L

**A77-51444** A new cycle for optimum energy storage in interplanetary missions E. Igenbergs (München, Technische Universität, München, West Germany) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper 77-141* 40 p

An investigation is conducted concerning an approach in which a spacecraft on a mission obtains energy from nuclear power plants or by the utilization of solar radiation and stores this energy for an employment in energy-consuming operations to be performed at a later time. In a brief analysis it is demonstrated, in a comparison of various possibilities that, of the considered systems, only a system which stores energy chemically in the form of elementary oxygen and hydrogen, obtained from water, provides a feasible low-weight energy storage method. A solar mirror-turbine/generator system and a system obtaining electric energy for the decomposition of water by means of solar cells are considered. The water formed, when the stored energy is withdrawn for use, is retained and can be employed again for additional energy-storage cycles. Formulas and graphs are

presented which illustrate the suitability of the discussed techniques for a number of spacecraft missions, giving particular attention to interplanetary missions to Mars and Venus. G R

**A77-51445** Automatic optimization of operating modes in thermionic electrical power generators L. M. Galkin, B. N. Petrov, and G. M. Ulanov (Institute of Control Sciences, Moscow, USSR) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper 77-142* 17 p 6 refs

The characteristics of a spacecraft power supply system consisting of thermionic converters which receive heat from a nuclear reactor source are examined. Using the experimental Soviet Topaz unit as an example, attention is given to ways of optimizing the operating mode, conversion efficiency, service life and reliability of a thermionic power system. It is decided that an adaptive control system which would maintain the optimal operating mode in the face of wide variations of system parameters is the best choice. B J

**A77-51508** Introductory remarks on space observations of long-term climatic changes produced by escalating energy use S. S. Penner (California, University, La Jolla, Calif.) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper A-77-01* 6 p 24 refs

Additions of CO<sub>2</sub> to the earth's atmosphere as a result of intensified worldwide economic and industrial activity are assessed for possible long-term climate-altering effects. Effects of accumulated CO<sub>2</sub> (including greenhouse effects) are considered more serious than effects of atmospheric particulate loading or direct heat addition at the present time. Mention is made of contributions by volcanic activity to climate alteration, possible use of space-positioned mirrors to moderate the earth's albedo, and laser absorption techniques for measuring mean temperatures in the atmosphere. R D V

**A77-51524** On the active and passive CETI from earth satellite orbit M. Subotowicz (Lublin, Uniwersytet, Lublin, Polskie Towarzystwo Astronautyczne, Katowice, Poland), J. Usowicz (Torun, Uniwersytet, Torun, Polskie Towarzystwo Astronautyczne, Warsaw, Poland), and Z. Paprotny (Polskie Towarzystwo Astronautyczne, Katowice, Poland) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper A-77-48* 14 p 7 refs

Technical problems involving the antennas considered for use in a communication with extraterrestrial intelligence (CETI) satellite project are discussed. The antenna system and monitoring are considered with reference to a search strategy. Topics examined include frequency range, thermal noises and deformations, Doppler shift correction, compensation of the dispersal effects, transmission time and distance, costs, and energy supply by the solar satellite power station. Attention is directed to the problems of possible perturbations of the orbit, undesirable motion of the antenna, and antenna mechanical oscillations. M L

**A77-51532** Space solar power versus space communications S. K. Sarkar (Swiss PTT, Berne, Switzerland) *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept. 25-Oct. 1, 1977, Paper 77-65* 8 p 8 refs

Since a space solar power station will occupy the same geostationary orbit as communications satellites and will also use the RF spectrum for transmission there must be a tradeoff between the two types of spacecraft in terms of resource allocation of orbit and spectrum. This paper briefly reviews design, operating and cost factors for both types of space system and emphasizes resource constraints and comparative benefits. The solar power station concept is criticized as being cost-ineffective. B J

**A77-51533** Socio-economic determinants of a program for lunar industrialization in support of space light development Lunetta and Soletta K. A. Ehrlicke (Space Global, Inc., La Jolla, Calif.)



*International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper A-77-66 59 p 10 refs*

Some ideas for space light facilities are outlined. The Lunetta system is for illumination. The Powersoletta system is for transmission of solar energy to drive terrestrial solar-electric power stations at night in addition to their operation by direct solar energy during the day. The Biosoletta system is for transmission of radiation energy for purposes of enhancing photosynthetic (food) production, and of thermal energy for local temperature modification. P T H

**A77-51561** International law and solar energy satellites. H Berger. *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper SL-77-52 19 p 27 refs*

Articles of the December 8, 1956 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies are examined with reference to their bearing on solar energy satellites. The first nine articles are considered; these articles deal with subjects such as the exploration of space, the prohibition of national appropriation of space resources, the requirements for conformity with international law, and liability. Topics which will require legal clarification include general questions, such as the freedom of use of outer space for transmission of energy to earth, and more specific issues, such as the allocation of frequencies for transmission of energy waves. Three other multilateral agreements are also mentioned. M L

**A77-51565** International law and the use of outer space for the production of solar power. L I Tenner. *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper SL-77-62 28 p 97 refs*

The paper examines the international legal ramifications of establishing and operating permanent space colonies to construct solar energy collecting satellites which would transmit the energy to earth via microwave. The Outer Space Treaty and other present and projected treaties contain provisions directly applicable to this type of project. The main issue concerns the ban on appropriation of outer space. Placement of a colony in geostationary orbit or at a Lagrange position may or may not be a violation of the Treaty. The Treaty also requires that activities of states in the exploration and use of outer space shall be carried out in the interests and for the benefit of all mankind. If world-wide sharing of the benefits of a solar energy satellite were required, the program may become economically unfeasible. Perhaps the producing state should just be required to make the electrical power or technological information available for purchase by other states on a nondiscriminatory basis. P T H

**A77-51575** Future space experiments with levitated capacitor for thermonuclear microexplosions. D Odstrcil. *International Astronautical Federation, International Astronautical Congress, 28th, Prague, Czechoslovakia, Sept 25-Oct 1, 1977, Paper 77-ST-11 12 p 5 refs*

The use of controlled thermonuclear microexplosions for space propulsion systems is considered. An electron beam method would be used for ignition, and a capacitor consisting of a superconducting torus is suggested for energy storage. Characteristics of this proposed capacitor are analyzed, and a space test platform that could be used to study the capacitor is described. M L

**A77-51587** Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite. T P Chen and S C Saxena (Illinois, University, Chicago, Ill.). *Fuel*, vol 56, Oct 1977, p 401-413. 32 refs. Contract No E(49-18)-1787

A model is developed for the combustion of coal in fluidized beds with sulphur emission control by limestone or dolomite. The gas and solid flow analysis is based on multiple gas bubbles of varying sizes which, accompanied by the cloud and wake, rise through the

particulate emulsion phase. Solids population balance relating the feed, overflow, and elutriation with the physiochemical changes of particles in the bed is carried out for coal and sulphur-absorbent respectively. The reactions in the bed are then formulated in terms of the above determined gas velocities and distribution functions for solids. Experimental data from various pilot-plant operations are used to assess the validity of the proposed model. The observed coal conversion and sulphur retention under various operating conditions are in good agreement with the predicted values. (Author)

**A77-51588** Ignition of droplets of liquid fuels solvent extracted from coal. J B Jordan, A Williams (Leeds University, Leeds, England), and G M Kimber (Coal Research Establishment, Cheltenham, Glos, England). *Fuel*, vol 56, Oct 1977, p 417-421. 27 refs

A single suspended-droplet technique has been used to study droplet combustion of a range of solvent-refined coal extracts in a furnace at 850 C. The small particles of extract are solid at room temperature but they rapidly liquefy on exposure to the hot furnace environment, permitting the size and mass-time combustion histories to be measured. Their combustion behaviour is discussed in terms of their high aromaticity and comparison with the single droplet combustion of fuel oils of different asphaltene content was used to highlight potential solids emissions problems which may arise when firing in large systems. (Author)

**A77-51589** Heavy-fuel flame radiation in gas turbine combustors - Exploratory results. E. M. Goodger and Y S. H. Najjar (Cranfield Institute of Technology, Cranfield, Beds, England). *Fuel*, vol 56, Oct 1977, p. 437-440. 6 refs

With lower costs and greater availability, heavy fuel oil appears as an attractive alternative to the conventional gas oil used in industrial gas turbines. However, higher levels of radiation and smoke are expected, and this note reports on some preliminary tests made with a combustion chamber burning fuels of different carbon content, ranging from kerosine to a 25% blend of residual fuel oil in gas oil, at a chamber pressure of 10 atm. The combustion rig was equipped with a total-radiation pyrometer and black-body furnace capable of measurement at different axial stations along the spray-stabilized flame. The presence of the residual fuel oil in the gas oil was found to promote significant increases in the mean levels of radiation, emissivity and smoke density, with a modest increase in liner temperature. (Author)

**A77-51590** Concurrent carbon gasification and carbon deposition in chars. A Linares Solano, O P Mahajan, and P L Walker, Jr (Pennsylvania State University, University Park, Pa.). *Fuel*, vol 56, Oct 1977, p 451, 452. 11 refs. Contract No E(49-18)-2030

The paper introduces the concept of the concurrent carbon gasification and carbon deposition in chars and notes that the rates of these two processes are interdependent with an interdependence that can change with the particular char used. In an experimental study, chars were produced from a Montana lignite and Saran (a copolymer of polyvinylidene chloride and polyvinyl chloride) by heating them to 1000 C and soaking for 2 h in N<sub>2</sub>. Weight changes produced in the acid-washed lignite char and in the Saran char, both at 900 C in various atmospheres, were observed. Results showed effects ranging all the way from the gasification reaction promoting a high rate of carbon deposition from methane, to carbon deposition completely retarding the gasification reaction. B J.

**A77-51611 #** Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator. D Holve and S. Self (Stanford University, Stanford, Calif.). *Combustion Institute, Fall Meeting, University of California, La Jolla, Calif., Oct. 18-20, 1976, Paper 76-53 22 p. 8 refs*

**A77-51621 #** A 1977 approach to sulfur oxide emissions. F F Ross (Central Electricity Generating Board, London, England). *American Society of Mechanical Engineers and Institute of Electrical*

and *Electronics Engineers, Joint Power Generation Conference, Long Beach, Calif., Sept 18-21, 1977, ASME Paper 77-JPGC-Pwr-1*. 13 p 35 refs Members, \$1 50, nonmembers, \$3 00

An appraisal of evidence that sulfur dioxide and the sulfate ion are harmless at the concentrations created by acceptable emission techniques, together with the acceptance of the value to the land of an atmospheric supply of sulfur, leads to the conclusions that there are no problems which the development of flue gas desulfurization would solve, there is no case for the development of low-sulfur fuels for large installations, the U S consumption of raw coal could be much greater than at present without deleterious effects, there will be a need for the provision, probably from coal, of low-sulfur energy for urban use, and research and development should be diverted from non-existent problems to directions where a real need exists.

(Author)

**A77-51623 #** A new approach to planning with gas turbines B. M. Kaupang and W. D. Marsh (General Electric Co, Schenectady, N Y) *American Society of Mechanical Engineers and Institute of Electrical and Electronics Engineers, Joint Power Generation Conference, Long Beach, Calif., Sept 18-21, 1977, ASME Paper 77-JPGC-GT-3* 7 p Members, \$1 50, nonmembers, \$3.00.

Gas turbines have traditionally been accepted by most the utility industry as an economic means for serving peak loads In the last few years, rapidly escalating fuel and capacity costs together with uncertainty regarding oil availability have raised questions as to whether gas turbines should still be applied for this purpose This paper will analyze the basic economic and operating principles of peaking generation and discuss how a new approach to the planning process shows why gas turbines still make economic sense in today's environment of tight supplies of capital and oil The techniques, discussed in this paper, for investigating the economic impact of gas turbine participation in utility plans for generation additions should contribute to the understanding and optimum utilization of the gas turbine in the utility industry

(Author)

**A77-51624 #** The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification R K Aliff, G B Manning (ERDA, Washington, D C), and R C Sheldon (General Electric Co, Gas Turbine Div, Schenectady, N Y) *American Society of Mechanical Engineers and Institute of Electrical and Electronics Engineers, Joint Power Generation Conference, Long Beach, Calif., Sept 18-21, 1977, ASME Paper 77-JPGC-GT-7* 9 p Members, \$1 50, nonmembers, \$3 00 ERDA-supported research

A study of turbine subsystem design sponsored by the High-Temperature Turbine Technology Program of ERDA is described, with emphasis on development of a water-cooled turbine for use in a combined cycle plant having integrated fixed-bed gasification In addition to water cooling, air and steam cooling concepts are considered, and various designs of buckets and nozzles applicable to high-temperature conditions are reviewed Fuels evaluated for the turbine system include coal oil and low-Btu gas It is suggested that the water-cooled turbine design could be used for mid-range and baseload operation in plants having outputs on the order of hundreds of megawatts

J M.B

**A77-51627** Critical materials problems in energy production. Edited by C. Stein (USAF, Weapons Laboratory, Albuquerque, New Mexico Institute of Technology, Socorro, N. Mex.) New York, Academic Press, Inc., 1976. 927 p. \$29.50

Materials problems in nuclear power generators are considered along with materials for high temperature applications, solar energy materials, materials for direct solar energy conversion, and materials problems related to coal and other fossil fuels Materials used for energy transmission and for energy storage applications are also discussed, taking into account superconducting materials, superconductivity, materials problems in rechargeable batteries, solid solution electrodes, solid electrolytes, materials for high-temperature Li-Al/FeS secondary batteries, the materials science of the super-flywheel, and metal hydrides for energy storage

G R

**Page Intentionally Left Blank**

## STAR ENTRIES

### **N77-28211# Lockheed Missiles and Space Co., Palo Alto, Calif ELECTROMECHANICAL STABILIZATION SYSTEM**

V Leontev [1977] 3 p Transl into ENGLISH from Aviatziya i Kosmonavtika (USSR) no 4, 1977 p 35  
Avail NTIS HC A02/MF A01, National Translation Center, John Crerar Library, Chicago, Ill 60616

Angular stabilization of space vehicles was examined. Rotation of an inertial mass, a flywheel is mentioned as an underlying operation principle and is discussed in detail. The principle of an electromechanical stabilization system is illustrated and analyzed. Results indicate that the application of an angular stabilization system distinguished by high utilization qualities, reliability and accuracy of functioning during a long period with minimal energy expenditure, significantly increases the time of efficient utilization of space vehicles in orbit. B B

### **N77-28305# Northwestern Univ., Evanston, Ill BASIC RESEARCH ON CERAMIC MATERIALS FOR ENERGY STORAGE AND CONVERSION SYSTEMS Progress Report, 1 Dec 1975 - 30 Nov 1976**

Donald H Whitmore Dec 1976 35 p refs  
(Contract EY-76-S-02-2564)  
(COO-2564-2) Avail NTIS HC A03/MF A01

Experimental probes for measuring the movement of ionic and electronic charge carriers in ceramic materials suitable for solid electrolyte and electrode applications in high-performance, secondary battery and fuel cell systems were utilized. Special emphasis is placed on developing (1) a better understanding of the effects of structure, impurities and composition on charge carrier transport mechanisms in such materials, and (2) detailed knowledge of the kinetics and mechanism of reactions occurring (on a microscopic scale) at the electrode-electrolyte interfaces of energy storage and conversion systems. ERA

### **N77-28322\*# National Aeronautics and Space Administration Langley Research Center, Langley Station, Va ALTERNATE AIRCRAFT FUELS PROSPECTS AND OPERATIONAL IMPLICATIONS**

Robert D Witcofski May 1977 44 p refs  
(NASA-TM-X-74030) Avail NTIS HC A03/MF A01 CSCL 21D

The potential use of coal-derived aviation fuels was assessed. The studies addressed the prices and thermal efficiencies associated with the production of coal-derived aviation kerosene, liquid methane and liquid hydrogen and the air terminal requirements and subsonic transport performance when utilizing liquid hydrogen. The fuel production studies indicated that liquid methane can be produced at a lower price and with a higher thermal efficiency than aviation kerosene or liquid hydrogen. Ground facilities of liquefaction, storage, distribution and refueling of liquid hydrogen fueled aircraft at airports appear technically feasible. The aircraft studies indicate modest onboard energy savings for hydrogen compared to conventional fuels. Liquid hydrogen was found to be superior to both aviation kerosene and liquid methane from the standpoint of aircraft engine emissions. Author

### **N77-28323# California Univ., Livermore Lawrence Livermore Lab BIOSOLAR PRODUCTION OF FUELS FROM ALGAE**

T W Jeffries, P H Moulthrop, H Timourian, R L Ward, and B J Berger 15 Nov 1976 41 p refs  
(Contract W-7405-eng-48)  
(UCRL-52177) Avail NTIS HC A03/MF A01

A design concept is described for the production of methane, hydrogen, and ammonia using solar energy. Filamentous, nitrogen fixing blue-green algae are employed as a source of biomass for methane and ammonia generation by anaerobic digestion and as a biological catalyst for the photoproduction of hydrogen from water. The resources needed, biomass production and harvest, anaerobic digester, the process of biophotolysis, and product separation are discussed. The environmental and genetic modifications possible to increase biomass production are indicated. Preliminary cost estimates are made for methane and hydrogen production. It is concluded that biosynthetic methane is not economically competitive with that derived from coal gasification but that hydrogen production offers a viable long range prospect. Author (ERA)

### **N77-28324# Edgerton, Germeshausen and Grier Inc, Idaho Falls, Idaho**

#### **GUIDE FOR THE CONVERSION TO AND MAINTENANCE OF HYDROGEN-FUELED, SPARK-IGNITED ENGINES**

F B Simpson, J H Lofthouse, D R Swope, and D L Henriksen Jan 1977 31 p refs  
(Contract EY-76-C-07-1570)  
(TREE-1036) Avail NTIS HC A03/MF A01

A guide to one approach to the conversion of an internal combustion engine to hydrogen fuel is presented. Safety aspects, conversion, operation and maintenance of the engine are also included. ERA

### **N77-28325# Exxon Research and Engineering Co, Linden, N.J Government Research Lab**

#### **EVALUATION OF METHODS TO PRODUCE AVIATION TURBINE FUELS FROM SYNTHETIC CRUDE OILS, PHASE 2, VOLUME 2 Final Report, 24 Jan 1975 - 24 Apr. 1976**

Charles D Kalfadelis Wright-Patterson AFB Ohio AFAPL May 1976 365 p  
(Contract F33615-74-C-2036)  
(AD-A036190, EXXON/GRU 2PEA 76-Vol-2,  
AFAPL-TR-75-10-Vol-2) Avail NTIS HC A16/MF A01 CSCL 07/1

An experimental pilot-plant program is described which has demonstrated that specification JP-4 wide-cut type and Jet A narrow-cut type aviation turbine fuels may be produced from domestic shale oils. Three shale oils and two coal-derived liquids were evaluated in the program, which is the second phase in a three phase overall program. The original whole crude samples were assayed and fractionated to yield kerosene-boiling-range feedstocks for catalytic hydrotreatment experiments. Three levels of hydrotreatment severity were investigated, using nickel-molybdenum and cobalt-molybdenum catalysts. Hydrotreated products were fractionated and rebled to yield finished fuels. The experimentally obtained process and analytical information will be used in the third phase of the program to provide a basis for an engineering and economic evaluation of the effect of the use of synthetic crude oil in a refinery processing both petroleum and synthetic crude. Author (GRA)

### **N77-28327# Dartmouth Coll., Hanover, N.H Thayer School of Engineering**

#### **LONG-TERM NATURAL RESOURCE AVAILABILITY ENVIRONMENTAL AND POLITICAL IMPLICATIONS IN THE UNITED STATES Annual Report, 15 Sep. 1972 - 15 Sep 1973**

Roger F Nail 1973 75 p refs  
(Grant NSF G1-34808)  
(PB-265762/5 DSD-9, NSF/RA/N-73-271, AR-1) Avail  
NTIS HC A04/MF A01 CSCL 21D

A summary of six projects that use computer simulation models to explore the potential role of coal as a transition fuel is presented. A dynamic simulation model that explores the

interaction between energy availability and economic growth during the transition from fossil fuel energy sources to ultimate energy sources was developed. Major areas where policy tests significantly affect the transition to coal were identified. The environmental standards study analyzes the nature of the constraint on increased coal use imposed by the problem of air pollution by sulfur dioxide emissions. An analysis on energy imports and international politics indicated the sensitivity of the study model to an increased rate of imports and its inability to cope with the strains generated by increased reliance on external sources. GRA

**N77-28328#** Federal Power Commission, Washington, D C  
Bureau of Natural Gas  
**NATIONAL GAS FLOW PATTERNS 1975 GEOGRAPHIC  
FLOW PATTERNS AND INTERCOMPANY RE-  
LATIONSHIPS**

Feb 1977 659 p  
(PB-266111/4) Avail NTIS HC A99/MF A01 CSCL 21D

The interrelationships existing in 1975 among the U S gas supply areas, the gas market areas, and the interstate natural gas pipeline network are examined. The volume of production out of each supply areas which goes into interstate pipelines, the volume going intrastate only, the major gas transfers between interstate pipelines, and the volume each pipeline delivers to each state for final consumption are given. Estimates of the gas volumes which flowed between any combination of areas and were directly connected are included. GRA

**N77-28329#** Stanford Research Inst., Menlo Park, Calif  
**THE HYDROGEN ECONOMY A PRELIMINARY TECHNOL-  
OGY ASSESSMENT Final Report**

Edward M. Dickson, John W. Ryan, and Marilyn H. Smulyan  
Feb 1976 407 p refs  
(Grant NSF ERP-73-02706, SRI Proj EGU-2836)  
(PB-266607/1, NSF/RA-760491) Avail NTIS  
HC A18/MF A01 CSCL 21D

Hydrogen must be manufactured from basic energy resources since it is not a naturally occurring energy form. The question of the feasibility of the use of hydrogen as a fuel was studied. Although it is generally believed that hydrogen might soon become less expensive than petroleum, competition among fuels in the energy marketplace and the need to derive hydrogen from other energy sources will insure that hydrogen does not become less expensive than alternatives for a very long time. Transitions involving change in basic infrastructure technologies, systems, and institutions are difficult to effect because new, embryonic systems must compete with established systems, often at a price disadvantage. The following are included: (1) summary and recommendations, (2) technology assessment and energy in the future, (3) hydrogen technologies, present and projected, (4) competing and complementing technologies, present and projected, (5) economics of hydrogen, (6) transition to a hydrogen economy, and (7) consequences of a hydrogen economy. GRA

**N77-28419#** Defense Intelligence Agency, Washington, D C  
**ELECTRIC VEHICLE RESEARCH, DEVELOPMENT AND  
TECHNOLOGY - FOREIGN**

James D. Busi Apr 1976 72 p ref Amendment A to  
DST-1850S-403-75  
(AD-A036458, DST-1850S-403A-75) Avail NTIS  
HC A04/MF A01 CSCL 13/6

Current research efforts and a computer analysis of foreign electrochemical traction battery technology utilizing various standardization and simulation techniques support the following ranking of foreign electric vehicle technology: United States, United Kingdom, Japan, Federal Republic of Germany, U S S R, France, Italy, and Sweden. All-electric vehicle systems (battery-battery or battery-fuel cells) are not presently competitive, on an energy or power density basis, with conventional, fossil-fueled, internal combustion engine systems. All-electric vehicle systems, however, offer an alternate or complementary mode of transportation in major metropolitan areas by reducing atmospheric pollution and fossil fuel consumption. Advanced

lead-acid, nickel-iron, and nickel-zinc traction batteries offer the greatest promise for urban transit vehicles (city buses, microbuses, and commuter cars). Commercial application of these electrochemical propulsion systems will receive considerable government and public support over the next 10 years in Europe, Japan, and the U S S R. High-energy electrochemical propulsion systems such as the sodium-sulfur, lithium-sulfur, and metal-air traction battery systems are theoretically promising. Actual utilization of these power sources in small military and domestic vehicles is anticipated by the late 1980s. GRA

**N77-28453#** Joint Publications Research Service, Arlington, Va

**HEAT TRANSPORTATION BY HOT WATER PIPE-LINES  
AT 90 DEG C**

J. M. Bourguet, H. Fischer, and L. Lancal Mar 1977 39 p  
refs Transl into ENGLISH from Tech de l'Energie (France),  
no 1, 1976 p 14-18  
(AD-A038301, CR EL-TL-576) Avail NTIS HC A03/MF A01  
CSCL 20/13

This report describes the possibility of transporting heat produced by Nuclear Power Plants for urban heating distribution systems by means of water at 90 C. Author (GRA)

**N77-28495#** Thermo Electron Corp., Waltham, Mass  
**FEASIBILITY TEST ON COMPOUNDING THE INTERNAL  
COMBUSTION ENGINE FOR AUTOMOTIVE VEHICLES,  
TASK 2 Final Report**

1976 250 p refs  
(Contract E(11-1)-2690)  
(COO-2690-1) Avail NTIS HC A11/MF A01

The most attractive use of the Organic Rankine Cycle System (ORCS) is in large heavy-duty diesel trucks for long distance hauling. A conceptual design study of compounding the diesel truck engine with an ORCS was made. Based on the results of the conceptual design study which showed a 15 percent fuel economy improvement potential over the duty cycle, an early feasibility demonstration test of the system was initiated. The demonstration system used a Mack EMDT 676 diesel engine with existing but nonoptimum ORCS hardware made available from an earlier automotive Rankine cycle program. The results of these feasibility demonstration tests, both steady state and transient over the operating range of the diesel engine, are presented. ERA

**N77-28558#** Jet Propulsion Lab., Calif Inst of Tech., Pasadena  
**BOREHOLE HYDRAULIC COAL MINING SYSTEM ANALY-  
SIS**

Elmer L. Floyd 21 Apr 1977 122 p refs  
(Contract NAS7-100)  
(NASA-CR-154119, JPL-Publ-77-19) Avail NTIS  
HC A06/MF A01 CSCL 08I

The borehole hydraulic coal mining system accesses the coal seam through a hole drilled in the overburden. The mining device is lowered through the hole into the coal seam where it fragments the coal with high pressure water jets which pump it to the surface as a slurry by a jet pump located in the center of the mining device. The coal slurry is then injected into a pipeline for transport to the preparation plant. The system was analyzed for performance in the thick, shallow coal seams of Wyoming, and the steeply pitching seams of western Colorado. Considered were all the aspects of the mining operation for a 20-year mine life, producing 2,640,000 tons/yr. Effects on the environment and the cost of restoration, as well as concern for health and safety, were studied. Assumptions for design of the mine, the analytical method, and results of the analysis are detailed. Author

**N77-28569#** Institute for Defense Analyses, Arlington, Va  
Program Analysis Div  
**OPTIMAL DRAWDOWN STRATEGY FOR STRATEGIC  
PETROLEUM RESERVES**

Robert E Kuene, Jerry Blankenship and Paul F McCoy Apr 1977 150 p refs  
(Contract FEA-CR-02-60857-00)  
(PB-265838/3 IDA-P-1252, IDA/ HQ-77-19019,  
FEA/8-77/142) Avail NTIS HC A07/MF A01 CSCL 21D

The problem addressed is if the United States had a reserve of petroleum of a given size to be used in case of an oil embargo, how should that petroleum be drawn from the reserve when an embargo actually occurs. The objective is to find a drawdown policy which maximizes the present value of total GNP benefits from petroleum drawn from the reserve minus the opportunity costs of holding the petroleum in storage. GRA

**N77-28573#** Federal Energy Administration, Washington, D C Office of Oil and Gas Analysis  
**PETROLEUM SITUATION REPORTS 1974-1975 Monthly Petroleum Statistics Report**  
Mar 1977 94 p  
(PB-265848/2, FEA/8-77/106) Avail NTIS  
HC A05/MF A01 CSCL 21D

Graphs detailing total imports, crude oil runs-to-stills, apparent demand for motor gasoline, and motor gasoline stocks, tables indicating total demand for petroleum products, imports of refined products, production, imports, demand and stocks of crude oil, motor gasoline, jet fuels, distillate fuel oil and residual fuel oil, are presented. GRA

**N77-28575#** Battelle Columbus Labs Ohio  
**PRODUCTION AND PROCESSING OF US TAR SANDS AN ENVIRONMENTAL ASSESSMENT Final Report**  
N A Frazier D W Hissong, W E Ballantyne, and E J Nazey Dec 1976 92 p refs  
(Contract EPA-68-02-1323)  
(PB-266266/6, EPA-800/7-76-035) Avail NTIS  
HC A05/MF A01 CSCL 08I

Factors traceable to the increasing shortfall in U S production of natural crude have rekindled interests in U S tar sands as a sources of synthetic fuel. Reported are the results of a preliminary study to assess the potential primary environmental impacts of production and processing of U S tar sands bitumen. With the possible exception attributable to chemical differences between tar sand bitumen and coal, potential environmental impacts of producing tar sands by mining methods would be similar in type to those of mining coal by the same method and in the same area as the tar sand deposit. Processes for extracting bitumen from the mined tar sand would generate solid waste in the form of spent sand. Constituents and quantities of emissions to air and water are process dependent but existing control technology and good environmental practices are technically applicable. A viable in situ production technology for producing tar sand reservoirs has not yet been demonstrated. On the basis of methods tested to date potential environmental impacts of producing tar sands by in situ methods would be very similar to those of conventional oil field production. Technical and economic factors will determine if in situ methods, or possibly underground methods, are an alternative to surface mining in environmentally sensitive areas. GRA

**N77-28576#** Aeronautical Research Labs Melbourne (Australia)  
**HYDROCARBON FUELS FROM SOLAR ENERGY VIA THE ALGA BOTRYOCOCCUS BRAUNII**  
L W Hillen and D R Warren Jul 1976 47 p refs  
(ARL/Mech Eng-148) Copyright Avail Issuing Activity

The production of liquid hydrocarbon fuels from a non-depleting source such as solar energy and algae is investigated. The alga *Botryococcus braunii*, which grows widely in nature, can produce hydrocarbons in amounts up to 75% of its dry mass. There is considerable contemporary and geological evidence especially in Australia that it is capable of prolific growth under appropriate conditions. Harvesting and processing is relatively simple compared with other energy crops. Problems involved in producing solar oil in this way on a large scale are assessed. Author

**N77-28577\*+** National Aeronautics and Space Administration Langley Research Center, Langley Station Va  
**AN ANNOTATED BIBLIOGRAPHY, VOLUME 1, APPENDIX 2**

Sandra J Blow Jul 1977 848 p  
(NASA-TM-74765 BIB 74-01-Vol-1-App-2) Avail NTIS  
HC A99 CSCL 05B

Abstracts of reports concerning energy are presented. The topics reported conclude energy and power, hydrogen and other fuels, waste heat utilization, nuclear, solar, and energy storage. F O S

**N77-28578\*+** National Aeronautics and Space Administration Langley Research Center, Langley Station Va  
**AN ANNOTATED BIBLIOGRAPHY, VOLUME 2, APPENDIX 2**

Sandra J Blow Jul 1977 874 p  
(NASA-TM-74764, BIB 74-01-Vol-2-App-2) Avail NTIS  
HC A99 CSCL 05B

For abstract see N77-28577

**N77-28582\*#** Jet Propulsion Lab Calif Inst of Tech, Pasadena  
**OPTIONS FOR DEMONSTRATING THE USE OF SOLAR ENERGY IN CALIFORNIA BUILDINGS**

E S Davis and G Yanow Sep 1976 33 p refs  
(Contract NAS7-100)

(NASA-CR-154103 JPL-Publ-77-33) Avail NTIS  
HC A03/MF A01 CSCL 10A

Three programmatic options for demonstrating the most economically attractive applications of solar energy to buildings located in California are formulated. The unique characteristics of solar energy demonstration programs and the involvement of key decision makers are discussed in detail. The demonstration programs are related to specific purposes. The priority structure used to select the generic projects making up each program is discussed in relationship to the purposes of the program. In addition some implications of the nature of the demonstration program for management are outlined. Author

**N77-28583\*#** National Aeronautics and Space Administration Pasadena Office, Calif  
**A NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM Patent Application**

M Kudret Selcuk, inventor (to NASA) Filed 27 May 1977 17 p

(Contract NAS7-100)  
(NASA-Case-NPO-13817-1, US-Patent-Appl-SN-801452) Avail NTIS HC A02/MF A01 CSCL 10A

A solar energy collector system characterized by an improved concentrator for directing incident rays of solar energy on parallel strip-like segments of a flat-plate receiver is described. A plurality of individually mounted reflector modules of a common asymmetrical triangular cross-sectional configuration is supported for independent reorientation. A plurality of asymmetric vee-trough concentrators for deflecting incident solar energy toward the receiver is defined. NASA

**N77-28584\*#** National Aeronautics and Space Administration Pasadena Office Calif  
**SOLAR POND Patent Application**

Charles G Miller and James B Stephens inventors (to NASA) Filed 30 Jun 1977 17 p

(Contract NAS7-100)  
(NASA-Case-NPO-13581-2 US-Patent-Appl-SN-811815) Avail NTIS HC A02/MF A01 CSCL 10A

Narrow elongated trenches, grouped together over a wide area, can be formed by bulldozer type equipment. Each trench is lined with a heat-absorbing black liner. The liquid in the bottom of each trench, used to absorb the solar energy, may be a brine solution or plain water depending on the means used to remove the thermal energy from the pond. The heat-absorbing liquid is kept separate from the thermal energy removing fluid by means such as clear polyethylene material. The covering for the pond may be a fluid or solid if the covering is a fluid fire fighting foam, continuously generated or siloons are used to keep the

surface covering clean and insulated. If the thermal energy removing fluid is a gas a fluid insulation layer contained in a flat polyethylene tubing is used to cover the pond. The side of the tube directed towards the sun is treated to block out ultraviolet radiation and trap infrared radiation. Author

**N77-28589# Wisconsin Univ Madison  
DESIGN PROCEDURE FOR SOLAR AIR HEATING SYSTEMS**

S A Klein, W A Beckman, and J A Duffie 1976 9 p refs  
Presented at the Joint Conf of the Am Section of the Intern Solar Energy Soc and the Solar Energy Soc of Canada, Inc Winnipeg, Manitoba Canada, 15 Aug 1976  
(Contract EY-76-S-02-2588)

(CONF-760842-14) Avail NTIS HC A02/MF A01

A solar air heating system incorporating a flat-plate air heater and packed bed thermal storage is described and a simulation model for the system is developed. The results of many simulations of the air heating system are used to establish the relationship between system performance and the system design and meteorological variables. The results are presented in analytic and graphical form, referred to as an f-chart for solar air heating systems. The results of simulations in several widely different climates suggest that the information presented in the f-chart is location independent. Methods of estimating the performance of air heating systems having a collector air capacitance rate and a storage capacity other than those used to generate the f-chart are included. ERA

**N77-28590# Aerospace Corp, Germantown, Md Environment and Energy Conservation Div**

**GEOTHERMAL ENERGY, AN ENVIRONMENTAL AND SAFETY MINI-OVERVIEW SURVEY**

Jul 1976 134 p refs  
(Contract E(04-3)-1101)

(ATR-77(7518)-1) Avail NTIS HC A07/MF A01

A survey is presented in order to determine the technology status, gaps, and needs for research and development programs in the environment and safety areas of this resource. The information gathered from a survey of geothermal energy development undertaken to provide background for an environment and safety overview program is summarized. A technology assessment for resource development is presented. The three specific environmental problems identified as most potentially limiting to geothermal development, hydrogen sulfide control, brine disposal, and subsidence, are discussed. Current laws, regulations, and standards applying to geothermal systems are summarized. The elements of the environment, health and safety program considered to be intrinsically related to the development of geothermal energy systems are discussed. Interagency interfaces are touched on briefly. ERA

**N77-28591# Sandia Labs, Albuquerque, N Mex  
TOTAL ENERGY SYSTEMS SOLAR ENERGY PROGRAM  
Semi Annual Review, Jul 1976**

Robert L Alvis and Robert L SanMartin Jul 1976 186 p refs

(Contract E(29-1)-789)

(SAND-76-5758) Avail NTIS HC A09/MF A01

Reviews are presented on the ERDA-New Mexico irrigation project, total energy program solar total energy campus study solar total energy test facility (including operating experience with parabolic cylindrical collector field), solar total energy project management, and mirror materials and selective optical coatings. ERA

**N77-28592# Colorado State Univ, Fort Collins Solar Energy Applications Lab**

**COOLING SUBSYSTEM DESIGN IN CUS SOLAR HOUSE 3**

D S Ward, T Uesaki, and G O G Loef Aug 1976 23 p  
(Contract EY-76-S-02-2858)

(COO-2858-1, Conf-760842-20) Avail NTIS HC A02/MF A01

The use of cooling storage in conjunction with lithium bromide adsorption chillers allows for improved operating conditions of

the cooling subsystem. Significant performance degradation in the absorption cooling capacity is evident whenever the chiller cycles are on and off during periods of low cooling demand. The capability of providing storage for the chiller output prevents short-term cycling of the absorption machine and significantly improves the seasonal average coefficient of performance of the cooling subsystems. Cool storage can also be utilized to allow for a lower cooling capacity of the absorption unit (lower tonnage), without decreasing the ability of the subsystem to meet the cooling demands of the building. ERA

**N77-28593# California Univ Livermore Lawrence Livermore Lab**

**BIOSOLAR SYNFUELS FOR TRANSPORTATION**

Carl J Anderson 17 Jan 1977 17 p refs

(Contract W-7405-eng-48)

(UCRL-52208) Avail NTIS HC A02/MF A01

A short review is given of biosolar sources of synthetic liquid fuels (synfuels) for transportation. There are a variety of ways to convert potentially large energy crops into fuels suitable for transportation use, e.g., liquid fuels such as methanol, ethanol, and pyrolytic oils. In addition, organic wastes are widely produced, and although they are still generally not considered a resource, there is little doubt that they will increasingly be recycled for their material and energy value. Major technical, social, economic, environmental, and political questions remain, and although the potential for biosolar transportation synfuels is large, it is still small compared to transportation energy demand. Because of their costs, early implementation of biosolar conversion schemes will likely not be in the area of transportation synfuels. ERA

**N77-28596# Energy Research and Development Administration, Washington, DC Div of Transportation Energy Conservation**

**HYDROGEN-VIA-ELECTRICITY: A CANDIDATE TRANSITIONAL TRANSPORTATION ENERGY SYSTEM CONCEPT**

W J D Escher Sep 1976 89 p refs

(ERDA-77-13, TEC-77/001, PT-67)

Avail NTIS

HC A05/MF A01

There is an expressed need to move transportation off oil. However, the strategic alternatives for creating a nonpetroleum energy base for transportation are all long-term, extremely costly systems (hydrocarbon synfuels, electricity, hydrogen energy), each having technical and socio-economic limitations and constraints which will govern their relative contributions. To preserve the options while conducting positive steps to obviate the possibility of energy shortfalls affecting transportation in the meanwhile, a transitional transportation energy systems approach may be needed. A candidate concept Hydrogen-via-Electricity (HVE) is described in terms of criteria for such a system, and also related to each of the strategic alternatives to establish compatibility. If implemented, the HVE Concept has the near-term potential for supporting a certain fraction of the energy needs of the following transportation subsectors: railroads, intercity trucking, urban and intercity buses, and selected fleet vehicle systems. ERA

**N77-28597# Energy Research and Development Administration, Washington, DC Div of Solar Energy**

**NATIONAL PROGRAM PLAN FOR RESEARCH AND DEVELOPMENT IN SOLAR HEATING AND COOLING**

Nov 1976 196 p refs

(ERDA-76-144) Avail NTIS HC A09/MF A01

This interim report on a National Program Plan for Research and Development in Solar Heating and Cooling is based on a thorough assessment of the present status of solar heating and cooling technology and presented with the confidence that the emerging solar energy industry will continue to conduct a broad range of R and D activities. This plan describes the Federal R and D program plan for solar heating and cooling, including those activities to be funded in whole or in part by the Federal Government. The program plan is compatible with, but more detailed than, that described in the National Plan for Solar Heating and Cooling, ERDA 23A. It is intended that this interim report be circulated widely for review and comment by all those concerned with the R and D aspects of solar heating and cooling. ERA

**N77-28598#** Electric Power Research Inst., Palo Alto, Calif  
**ELECTRIC UTILITY SOLAR ENERGY ACTIVITIES, 1976 SURVEY**

L. D. Cleary Jan 1977 83 p  
 (EPRI-ER-321-SR) Avail NTIS HC A05/MF A01

The results of a survey to determine the scope and extent of solar energy projects sponsored by electric utilities are presented. Brief descriptions of the active operations along with information contacts are listed for each participating utility. Included for cross-reference is a list of the utilities involved with projects designated by category and an address list of the utilities. ERA

**N77-28599#** Brookhaven National Lab., Upton, N. Y  
**BRIEFING BOOK ON THE ENERGY SITUATION IN NEW ENGLAND**

Joel P. Brainard, James S. Munson, and Philip F. Palmedo Oct 1976 138 p refs  
 (Contract EY-76-C-02-0016)  
 (BNL-21918) Avail NTIS HC A07/MF A01

This briefing book is designed to give a concise overview of the facts of the energy situation in New England and of attitudes within the region towards current energy issues. Many of the central problems of U.S. energy policy are manifested in the region in a magnified form. The region entered the period of energy shortages and increasing prices in an economically declining condition. Energy prices were already high in 1970, 30% higher than rest of the country; the difference increased to 38% by 1974. With essentially no indigenous energy resources, New England is an energy-importing region. For various reasons it is also more dependent on petroleum than other regions of the country and, at the same time, distant from domestic petroleum-producing regions. The result is that over 60% of the fuels it consumes are also imported from abroad. Although the future supply of energy to the region is critically dependent on energy-resource policies, policies related for example to coal and oil shale development, the region's concerns cluster around policies and technologies that are perceived to have a more direct impact on its energy welfare. Thus energy conservation, solar energy, nuclear power, offshore oil development and, in general, the price of energy to the region are paramount issues of concern and debate. Following the introductory chapter, these issues are discussed in four additional chapters: The Energy Situation in New England, Regional Energy Issues, Energy-Related Institutions, and State Legislation. ERA

**N77-28600#** Brookhaven National Lab., Upton, N. Y  
**HYDROGEN PRODUCTION AND STORAGE IN UTILITY SYSTEMS** Semiannual Progress Report, Jul. - 31 Dec 1976

F. J. Salzano Jan 1976 79 p refs  
 (Contract EY-76-C-02-0016)  
 (BNL-50590) Avail NTIS HC A05/MF A01

A conceptual design of an electric storage system has been developed. Break-even cost data for introducing electric storage devices into the national energy system have been developed. Six materials were evaluated as substitutes for asbestos in the alkaline cell for use in 20 to 30 percent KOH at 150 to 160 C. Three of these look promising. Tests were conducted on the largest hydride test bed (84 lb granular FeTi) to determine the length of time various flow rates could be sustained in the Hydrogen Technology Advanced Components Test System, design specifications and cost goals based on small-scale tests and analysis have been established for the storage components. Design specifications and cost goals have also been established for electrolyzer components. Several compositions of the TiFe/sub y/Mn/sub z/H/sub x type were investigated. These compositions show greatly reduced dissociation and association pressures which subsequently may reduce the electrolysis unit and hydride storage vessel costs. ERA

**N77-28601#** Argonne National Lab., Ill  
**SOLAR ENERGY AND ELECTRIC UTILITIES: CAN THEY BE INTERFACED?**

Joseph G. Asbury and Ronald O. Mueller Aug 1976 35 p refs  
 (Contract W-31-109-eng-38)  
 (ANL/ES-52) Avail NTIS HC A03/MF A01

The economics of solar systems that interface with electricity supply systems are discussed. First, adopting the implicit assumption of many solar system designers of abundant supplies of low-cost off-peak electricity, systems studies of several of the more important solar energy applications are presented. It is shown that much of the electricity supply savings claimed for solar energy systems stem from the storage, rather than the solar, component of the system. Second, employing a standard economic representation of the periodic load problem, the general problem of interfacing solar energy and electric utility supply systems is examined. The general conclusion is that solar energy systems and conventional electric utility systems represent a poor technological match. The basic problem is that both technologies are very capital intensive. ERA

**N77-28603#** Radian Corp., Austin, Tex  
**SAMPLING STRATEGY AND CHARACTERIZATION OF POTENTIAL EMISSIONS FROM SYN FUEL PRODUCTION SYMPOSIUM**

1976 152 p refs Symp held at Austin, Tex., 8-10 Jun 1976  
 (Contract W-7405-eng-26)  
 (CONF-760602) Avail NTIS HC A08/MF A01

The rapidly increasing energy demand has brought increased emphasis on the conversion of coal and oil shale to fluid fuels. These solid fuels provide a significantly greater pollution potential than petroleum. For the conversion program to be successful, effort must be directed toward the establishment of meaningful emissions standards. Yet meaningful regulations cannot be established for these processes without reliable emission stream data that are not now available. While the need for stream composition data is widely recognized, the complexity of the technology and the absence of representative equipment combined with the need for complex sampling and analytical procedures have limited progress in data acquisition. GRA

**N77-28604#** Energy Research and Development Administration, Washington, D. C. Div of Solar Energy  
**NATIONAL PROGRAM FOR SOLAR HEATING AND COOLING OF BUILDINGS**

Nov 1976 63 p refs  
 (ERDA-76-6) Avail NTIS HC A04/MF A01

The National Program presented in this report, reflects the results of continuing assessment of initial plans, additional program planning activities, and experience gained this past year by ERDA and other program participants. As a result of these undertakings, strategies and plans for the research, development and demonstration activities outlined in ERDA-23A have been updated. The status of those activities funded totally or partially by ERDA is presented. This report thus supercedes ERDA-23A. ERA

**N77-28605#** Energy Research and Development Administration, Washington, D. C.  
**CREATING ENERGY CHOICES FOR THE WESTERN REGION**

1976 36 p Presented at 3rd Public Meeting on a Natl Plan for Energy Res., Develop and Demonstration, Denver, 17-18 May 1976  
 (ERDA-76/1-PM-3, Conf-760597) Avail NTIS HC A03/MF A01

Regional meetings to provide the public with an opportunity to exchange information and opinions about Federal energy planning are discussed. Topics considered include energy conservation, synthetic and fossil fuels technology development and commercialization, environmental and socio-economic impacts of energy resource development, solar and geothermal energy, and intensive electrification. A range of important, and often conflicting, opinions expressed on energy planning, funding priorities, and environmental impacts are summarized. ERA



**N77-28606#** ICF, Inc., Washington, D C  
**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES)  
 DOCUMENTATION. VOLUME 6: METHODOLOGY FOR  
 IMPROVING THE PRICE SENSITIVITY OF THE PIES OIL  
 AND GAS SUPPLY CURVES**

Washington FEA Sep 1976 51 p refs  
 (Contract FEA-CO-05-50301-00)  
 (PB-264069/6, FEA/N-76/416-Vol-8) Avail NTIS  
 HC A04/MF A01 CSCL 10A

A methodology for improving the price sensitivity of the oil and gas supply models used in Project Independence analyses is examined. Emphasis is placed on the question of improving the responsiveness of supply from currently existing proved reserves to changes in output prices. GRA

**N77-28607#** ICF, Inc., Washington, D C  
**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES)  
 DOCUMENTATION. VOLUME 7: METHODOLOGY FOR  
 DEVELOPING MORE COMPLEX INVESTMENT AND  
 PRODUCTION PROFILES IN THE FEA OIL AND GAS  
 SUPPLY MODEL**

Sep 1976 24 p ref  
 (Contract FEA-CO-05-50301-00)  
 (PB-264649/5, FEA/N-76/417-Vol-7) Avail NTIS  
 HC A02/MF A01 CSCL 10A

The possibility of altering the oil and gas supply models to utilize more complex investment and production profiles, especially in frontier oil and gas provinces is investigated. The assumptions used in the models with respect to timing of investment and production are acceptable for mature oil and gas provinces, but are less so for frontier production areas. Investment leadtimes and rates of production build-up are slower in virgin provinces, which leads to underpriced petroleum and overestimated production in these areas. GRA

**N77-28608#** Joint Publications Research Service, Arlington, Va  
**SOME THOUGHTS ON OPTIMIZING LONG-DISTANCE  
 HEAT TRANSPORT SYSTEMS AND THEIR STORAGE  
 FACILITIES**

P Charroppin Dec 1976 37 p Transl into ENGLISH of an unpublished manuscript (France), Nov 1975 46 p  
 (AD-A038253, CRREL-TL-568) Avail NTIS HC A03/MF A01  
 CSCL 18/13

This document stems from the study of transport of heat produced in nuclear power reactors with a high enough rating to benefit by scale economy and relying on seasonal storage to flatten the production curve. It aims at optimizing such transport systems and is first of all a search for a simple mathematical method for determining immediately the optimal diameters and the corresponding costs. Author (GRA)

**N77-28609#** Northwestern Technological Inst., Evanston, Ill  
**HEAT EXTRACTION FROM HOT, DRY ROCK MASSES  
 Progress Report, 1 Feb. - 31 Jul. 1976**

J Weertman, J D Achenbach, Z P Bazant, J Dundurs, L M Keer, T Mura, and S Nemat-Nasser Oct 1976 186 p refs  
 (Grant NSF AER-75-00187)  
 (PB-265116/4, NSF/RA-760395) Avail NTIS  
 HC A09/MF A01 CSCL 08I

Geothermal energy conversion processes are studied. The following subjects are treated: (1) analytic study of crack growth and shape, (2) finite element solution of geothermal energy extraction, (3) fluid flow through cracks, (4) model experiments, and (5) seismic detection of hydraulically induced fractures. GRA

**N77-28610#** Louisiana State Univ., Baton Rouge Center for Wetlands Resources  
**OIL AND GAS USE CHARACTERIZATION, IMPACTS, AND GUIDELINES**

W H Conner, J H Stone, L M Bahr, V R Bennett, J W Day, Jr., and R E Turner Jun 1976 160 p refs. Sponsored in part by Louisiana State Planning Office, Baton Rouge, Coastal Resources Program, Louisiana Wildlife and Fisheries Commission,

Baton Rouge, and Louisiana Coastal Commission, Baton Rouge (PB-265267/5, LSU-T-76-006, NOAA-77021602) Avail NTIS HC A08/MF A01 CSCL 08J

A nontechnical survey of oil and gas activities and their impacts on wetland, and a discussion of preliminary guidelines for optimizing production and minimizing impact are presented. GRA

**N77-28611#** Construction Engineering Research Lab (Army), Champaign, Ill Energy Branch  
**MARKET EVALUATION STUDY SOLAR DOMESTIC  
 WATER HEATERS FOR DOD BARRACKS Final Report**

Larry Walton Windingland, George Walton, and Douglas Hittle Feb 1977 40 p refs  
 (Contract FEA-CG-05-50083-00)  
 (AD-A036479, CERL-TR-E-102) Avail NTIS  
 HC A03/MF A01 CSCL 13/1

This study assesses the potential market for solar domestic hot water systems in DOD bachelor enlisted and bachelor officer quarters (barracks). The number and locations of existing and planned bachelor enlisted and bachelor officer quarters in the United States are analyzed, and the locations where solar domestic water heating is most feasible are determined. Life-cycle costs of providing solar domestic water heating systems are analyzed and the DOD market potential for these systems determined for varying system costs. The results of more than 120 one-year solar hot water heating system simulations are presented along with a dimensionless graph and methodology which can be used to estimate solar hot water heater performance for building loads and sites other than those studied. The potential markets for solar collectors based on varying system costs are presented. Results indicate that at an anticipated future system cost of \$9/sq ft (\$97/sq m) of collector the probable market for solar collectors is 4.4 million sq ft (409,000 sq m). Over a 20-year life, the potential savings resulting from application of this collector area is estimated to be 4.5 million barrels of fuel and \$29 million. Author (GRA)

**N77-28613#** Arizona Univ., Tucson Optical Sciences Center  
**INVESTIGATION OF HIGH TEMPERATURE PERFORMANCE  
 OF THIN FILM, SOLAR-THERMAL ENERGY CONVERTORS  
 Summary Report, 30 Jun. 1976 - 29 Jun. 1976**

Keith D Masterson and B O Seraphin Sep 1976 36 p  
 (Grant DI-G-0254032)  
 (PB-265554/6, BM-OFR-65-77) Avail NTIS  
 HC A03/MF A01 CSCL 10B

A high temperature reflectometer was used to determine the high temperature performance of selective surfaces. The specular reflectance for nine samples of the absorber-reflector-tandem type with absorber layers of  $ZrC(x)N(y)$  was obtained for temperatures up to 700C in some cases. A diffuse reflectometer of the integrating sphere type was used to characterize several samples that used fine grain texturing to enhance solar absorption. Specular reflectance measurements for such samples are unreliable because of the large fraction of light that is scattered out of the beam. During the final quarter, stainless steel substrates were coated with chemical vapor deposited molybdenum. Although these sample coatings did not have infrared reflectance as high as expected from previously obtained data, they will be useful for initial stability tests with the Bureau of Mines absorbers. GRA

**N77-28614#** Bureau of Mines, Denver, Colo Intermountain Field Operation Center  
**PROJECTS TO EXPAND FUEL SOURCES IN WESTERN  
 STATES. SURVEY OF PLANNED OR PROPOSED COAL  
 OIL SHALE, TAR SAND, URANIUM, AND GEOTHERMAL  
 SUPPLY EXPANSION PROJECTS, AND RELATED INFRA-  
 STRUCTURE, IN STATES WEST OF THE MISSISSIPPI  
 RIVER (AS OF MAY 1976)**

John S Corsentino Sep 1976 222 p refs  
 (PB-265633/8, BM-IC-8719) Avail NTIS HC A10/MF A01  
 CSCL 10A

A listing is made of fuels-related projects that are presently under construction, planned, or proposed by various companies.

and organizations in the Western United States. The future facilities covered fall into the following categories: coal mines and expansions to existing mines, electric powerplants and waste-to-fuel conversion plants, oil shale projects, tar sands projects, potential geothermal facilities, coal slurry pipelines, railroads related to fuels development, uranium mines and enrichment facilities, oil refineries, and natural gas processing plants. GRA

**N77-28616#** Federal Energy Administration, Washington, D C  
Office of Finance and Environment  
**FEA ENERGY FINANCING WORKSHOPS SECTION 1. SUMMARIES OF PROCEEDINGS SECTION 2: BACKGROUND PAPERS**

Jan 1977 701 p refs  
(PB-265706/2, FEA/G-77/011) Avail NTIS  
HC A99/MF A01 CSCL 10A

During 1976, the Federal Energy Administration sponsored a series of workshops on the financing of different energy sources. The workshops are: (1) Eastern Coal, (2) Western Coal, (3) Socioeconomic Impacts of Western Energy Development, (4) Electric Utilities, (5) Supplemental Gas Projects. This combined collection of Summaries and workshop background papers provides a significant compilation of background and views concerning several of the most important energy finance issues currently facing the Nation. GRA

**N77-28616#** Federal Energy Administration, Washington, D C  
Office of Policy, Program Development and Environment  
**QUARTERLY REPORT TO US HOUSE AND SENATE COMMITTEES ON APPROPRIATIONS (3RD) Quarterly Report, Jun. - Sep 1976**

Jan 1977 40 p refs  
(PB-265490/3, FEA/D-77/027, QR-3) Avail NTIS  
HC A03/MF A01 CSCL 10A

The process of the Federal Energy Administration's (FEA) energy conservation programs and short- and long-term accomplishments are reported to the House and Senate Committees on Appropriations. GRA

**N77-28618#** Southern Methodist Univ., Dallas, Tex  
**DEVELOPMENT OF LOW COST THIN FILM POLYCRYSTALLINE SILICON SOLAR CELLS FOR TERRESTRIAL APPLICATIONS Final Report, 1 Jun 1973 - 30 Nov. 1976**

Ting L Chu Jan 1977 107 p refs  
(Grant NSF AER-73-07843)  
(PB-266057/9) Avail NTIS HC A06/MF A01 CSCL 10B

The purification of metallurgical silicon has been investigated in detail. Using chemically treated metallurgical silicon recrystallized on graphite as a substrate, epitaxial silicon films and solar cell structures have been deposited and characterized. Large area (30 sq cm) cells have AM1 efficiencies of up to 5.5%, and small area (5 sq cm) cells have AM1 efficiencies higher than 6%. GRA

**N77-28619#** National Academy of Sciences - National Research Council, Washington, D C  
Committee on Measurement of Energy Consumption  
**ENERGY CONSUMPTION MEASUREMENT DATA NEEDS FOR PUBLIC POLICY**

1977 120 p refs  
(Contract FEA-CO-03-50343-00)  
(PB-266039/7, FEA/B-77/159) Avail NTIS  
HC A06/MF A01 CSCL 10A

The need for improved data on energy consumption and some general methods of collecting and organizing data for use in designing and evaluating public policy are analyzed. GRA

**N77-28620#** Lincoln Lab., Mass Inst of Tech., Lexington  
**EXPLORATION OF MOLECULAR SIEVE ZEOLITES FOR THE COOLING OF BUILDING WITH SOLAR ENERGY Final Report, 1 Sep. 1974 - 31 Aug 1975**

D I Tchernev 1 Feb 1977 99 p  
(Grant NSF AER-74-09038)  
(PB-266055/3, NSF/RA-770017) Avail NTIS  
HC A05/MF A01 CSCL 13A

The usefulness of molecular sieve zeolites for solar sorption heating and cooling has been investigated. Two different approaches have been used: one in which the temperature of the zeolite is uniform, the other in which a temperature gradient is established across the zeolite. With one-square-foot test panels using the uniform temperature approach, overall engineering efficiencies as high as 75% for heating with a condenser temperature of 60C (140F) were obtained. Cooling efficiencies as high as 45% were obtained for a condenser temperature of 50C (120F), the maximum temperature expected for an air-cooled condenser. GRA

**N77-28628#** Systems Applications, Inc., San Rafael, Calif  
**THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA DATA ANALYSIS AND EMISSION IMPACT MODEL Final Report**

Mei-Kao Liu, Dale Durran, Pravin Mundkur, Mark Yocke, and Jody Ames 15 Sep 1976 336 p refs

(Contract ARB-4-258)  
(PB-264822/8, EF76-18R, ARB-R-4-258-76-54) Avail NTIS  
HC A15/MF A01 CSCL 04A

Mathematical models developed to study the effects on air quality of using high-sulfur fuels in power plants are described. The Reactive Plume Model (RPF), adopting a trajectory approach, accommodates variations in wind speed, plume spread, and ambient concentrations. The Buoyant Plume Model (BPM) predicts plume rise and effluent dispersion near the stack. It invokes the Navier-Stokes equation with the Boussinesq approximation, and allows for plume-generated turbulent diffusion. The Plume Dispersion Model (PDM) simulates pollutant distributions far downwind. PDM solves the three-dimensional atmospheric diffusion equation, and incorporates variations in wind speeds. GRA

**N77-28642#** Aerotherm Acurex Corp., Mountain View, Calif  
**EVALUATION OF MOLTEN SCRUBBING FOR FINE PARTICULATE CONTROL Final Report, Dec 1975 - Feb 1976**

G G Poe, L R Waterland, and R J Schreiber Mar 1977 39 p refs

(Contract EPA-68-02-1318)  
(PB-266092/6, EPA-600/2-77-067) Avail NTIS  
HC A03/MF A01 CSCL 07A

The results of an evaluation of molten scrubbing for particulate control are given. Application of the concept to fine particulate clean-up in advanced energy processes seems possible. Molten scrubbing is especially well-suited to processes where simultaneous removal of sulfur compounds is desired. GRA

**N77-28644#** Mitre Corp., McLean, Va  
METREK Div  
**EPA AND ERDA HIGH-TEMPERATURE/HIGH-PRESSURE PARTICULATE CONTROL PROGRAMS Final Report**

R A Kennedy, H Dhillon, and J B Truett Feb 1977 60 p refs

(Contract EPA-68-01-3539)  
(PB-266231/0, EPA-600/7-77-013) Avail NTIS  
HC A04/MF A01 CSCL 07A

The report describes and compares current projects sponsored by EPA and the U.S. Energy Research and Development Administration (ERDA), relating to the control of particulate matter in fuel gas streams at high temperatures (1000 to 2000 F) and high pressures (5 atm and greater). The descriptions document each project and provide a narrative statement of objectives and technology involved. Project descriptions provide bases for identifying overlap or duplication, and indicate areas not addressed by either Agency. Comparison of EPA and ERDA activities for possible overlap and omissions is summarized in the conclusions, which indicate that there is little evidence of any overlap or

duplication No projects are dedicated exclusively to characterization and study of aerosol mechanics, however, one such EPA-sponsored study was completed recently Some characterization work is done at ERDA, incident to advanced energy systems development Development of instrumentation is limited and does not extend to the expected 1000-psig operating range GRA

**N77-28645#** Monsanto Research Corp., Dayton, Ohio  
**DESIGN OF MINIMUM-WEIGHT DIFFUSION BATTERIES**  
**Final Report, Sep 1973 - Sep 1974**

A L Marcum, L E Drescher, A Wojtowicz, and W H Hedley  
Jan 1977 37 p refs  
(Contract EPA-68-02-1320)  
(PB-266217/9 MRC-DA-452, EPA-600/2-77-001) Avail  
NTIS HC A03/MF A01 CSCL 14B

Particulates in the atmosphere and in the industrial exhaust gases are being monitored extensively in the field Field work is often seriously hampered by equipment that is heavy or bulky The diffusion batteries currently in use weigh in excess of fifty pounds and are often the heaviest piece of equipment in a test setup For this reason, it was felt that the possibility of optimizing the dimensions of the battery for minimum weight should be investigated The objectives of this study were first, to analyze the relationship between the physical dimensions of the battery and operational parameters to determine if an optimum configuration exists, and second, to design a series of optimum weight batteries based upon the results of the study The technical discussion which follows is limited to the first of these objectives GRA

**N77-28689#** National Oceanic and Atmospheric Administration,  
Boulder, Colo Wave Propagation Lab

**SOLAR RADIATION ATMOSPHERIC TRANSMISSION**  
**RESEARCH, PHASE 1 Final Report**

G M Lerfeld, V E Derr, R F Poeschel, and R L Hulstrom  
(Martin Marietta Corp., Denver) Jan 1977 162 p refs  
(PB-266010/8, NOAA-TM-ERL-WPL-18, NOAA-77031804)  
Avail NTIS HC A08/MF A01 CSCL 04A

Part 1 reviews the overall work program and states conclusions and recommendations Part 2 is a detailed analysis of solar photometric data collected on two days, a summer day with relatively large amount of atmospheric water vapor and some aerosol content, and a winter day, which had clear dry conditions Results demonstrate the utility of using spectral data to differentiate between absorbing components and the importance of having additional data (cloud condition data) when attempts are made to estimate direct irradiance values from total hemispherical (pyranometer) data GRA

**N77-28933\*** National Aeronautics and Space Administration  
Pasadena Office Calif

**LIGHTWEIGHT REFLECTOR ASSEMBLY Patent**

Maurice J Argoud (JPL) Jack Jolley (JPL), and Walter L Walker  
inventors (to NASA) (JPL) Issued 12 Jul 1977 9 p Filed 24  
Sep 1975 Supersedes N75-32894 (13 - 23, p 2979) Sponsored  
by NASA

(NASA-Case-NPO-13707-1 US-Patent-4 035,065,  
US-Patent-Appl-SN-617202 US-Patent-Class-350-310,  
US-Patent-Class-350-288, US-Patent-Class-350-320) Avail  
US Patent Office CSCL 20F

An inexpensive lightweight reflective assembly member having good optical quality and particularly adaptable to accommodating temperature variations without providing destructive thermal stresses and reflective slope errors is described The reflective assembly consists of a thin sheet of glass with appropriate reflective coating and a cellular glass block substrate bonded together The method of fabrication includes abrading the cellular substrate with an abrasive master die to form an appropriate concave surface An adhesive is applied to the abraded surface and a lamina reflective surface is placed under a uniform pressure to conform the reflective surface onto the desired abraded surface of the substrate

Official Gazette of the U S Patent Office

**N77-28948#** Florida Univ., Gainesville Dept of Engineering  
Sciences

**TWO-PHASE HARTMANN FLOWS IN THE MHD GENERATOR CONFIGURATION Annual Report, Dec 1975 - Dec 1976**

E R Lindgren, U H Kurzweg R E Elkins, and T A Trovillion  
Jan 1977 35 p refs  
(Contract N00014-76-C-0410, NR Proj 099-412)  
(AD-A036452) Avail NTIS HC A03/MF A01 CSCL 20/9

Two-phase Hartmann flows in an MHD generator duct of rectangular cross-section are examined and numerical values for the velocity fields and induced current streamlines for fluids of spatially-dependent electrical conductivity are determined as a function of load factor, Hartmann number and channel aspect ratio This study is of considerable practical interest in connection with some experimental work on two phase liquid metal-gas MHD generators and the results presented herein may enhance the understanding of the operating characteristics of such devices Results indicate that conductivity gradients can produce inflected velocity profiles which may be hydrodynamically unstable, that for larger load factors the shunt current in the Hartmann boundary layers become considerable and that two-phase MHD flows of moderate void fractions have sound speeds considerably lower than in its components Turbulent effects are not considered in these studies since turbulent fluctuations are expected to be suppressed for the high Hartmann number flows of interest in two-phase MHD generators GRA

**N77-29001#** Massachusetts Inst of Tech Cambridge Energy  
Lab

**OPEC AND THE MONOPOLY PRICE OF WORLD OIL**  
**(WORLD OIL PROJECT)**

Jacques Cremer and Martin L Weitzman Apr 1976 22 p  
refs  
(Grant NSF SIA-75-00739)

(PB-265015/8, MITEL76-015WP NSF/RA-760476) Avail  
NTIS HC A02/MF A01 CSCL 21D

A dynamic model is presented of the behavior of OPEC viewed as a monopolist sharing the world oil market with a competitive sector In order to study the influence of long term considerations on the price of oil a dynamic model of the capital theoretic type was built GRA

**N77-29003\*#** Jet Propulsion Lab., Calif Inst of Tech Pasadena  
**COSTS AND ENERGY EFFICIENCY OF A DUAL-MODE SYSTEM**

R C Heft Apr 1977 76 p refs  
(Contracts UMTA-RD-CA-06-0088 DOT-AT-60008)  
(NASA-CR-154251, JPL-77-34 UMTA-RD-CA-06-0088-76-2)  
Avail NTIS HC A05/MF A01 CSCL 05C

The life cycle costs of a dual mode system for both public and semiprivate ownership are examined and the costs in terms of levelized required revenue per passenger mile are presented The energy use of the dual mode vehicle is analyzed by means of a detailed vehicle simulation program for the control policy and guideway system Several different propulsion systems are considered Author

**N77-29007#** Stanford Research Inst Menlo Park Calif Center  
for Resource and Environmental Systems Studies

**THE POTENTIAL FOR REUSABLE HOMOGENEOUS CONTAINERS Interim Report**

Richard L Goen, Robert V Steele Laszlo P Somogyi and Norman  
Fishman Feb 1977 56 p refs  
(Grant NSF AER-76-02396 SRI Proj EGU-5674)  
(PB-265100/8, SRI/CRESS-17 NSF/RA-770030) Avail  
NTIS HC A04/MF A01 CSCL 13B

The feasibility of reusable containers for food products (excluding beverages) is examined The conclusions of the many studies of reusable beverage containers are reviewed along with the food packaging share of the packaging market the contribution of food packaging to the generation of solid waste and the quantities of food used in the food service industry Concepts

for reusable food containers--glass or plastic are presented including two types of systems for the return of the containers after use. The total energy use for a glass reusable container system, and for one configuration and size of a plastic reusable container system is derived. GRA

**N77-29026#** Wendell Associates, McLean, Va  
**FEDERAL ASSISTANCE PROGRAMS AND ENERGY DEVELOPMENT-IMPACTED MUNICIPALITIES**

Washington FEA Feb 1976 112 p refs  
 (Contract FEA-CO-04-60431-00)  
 (PB-265804/5, FEA/D-77/039) Avail NTIS  
 HC A06/MF A01 CSCL 13B

Federal assistance programs which do or could provide aid for small communities impacted by major energy development are identified. It is also intended to analyze other programs of assistance to local governments to show why they are not presently suitable for use by these communities and to indicate what kinds of changes would be necessary to make them useful to such communities. GRA

**N77-29269#** Case Western Reserve Univ., Cleveland, Ohio  
 Dept of Metallurgy and Materials Science

**HYDROGEN SULFIDE STRESS CORROSION CRACKING IN MATERIALS FOR GEOTHERMAL POWER**

R F Hehemann, A R Troiano, B Abu-Khater, and S Ferrigno  
 1976 34 p refs Presented at the Electrochem Soc Meeting, Las Vegas, Nev., 17 Oct 1976  
 (Contract EY-76-S-02-2576)

(COO-2576-3, Conf-761057-2) Avail NTIS

The performance of alloys used in geothermal power systems is evaluated. Alloys which are commercially available and those which have modified metallurgical structures and/or composition modifications were tested to determine the corrosive effects of the H<sub>2</sub>S and thermal environments in geothermal fluids. Hydrogen embrittlement and sulfide stress corrosion cracking were tested. Test results showing the effects of alloy composition, tempering temperatures, fluid temperature and salt content and ageing on sulfide stress cracking are tabulated. ERA

**N77-29318#** Midwest Research Inst Kansas City, Mo  
**SYSTEM STUDY OF FUELS FROM GRAINS AND GRASSES**  
**Quarterly Progress Report, Jul. - Oct. 1976**

W Benson, R Athey, and A McElroy 15 Nov 1976 70 p  
 (Contract E(29-2)-3729)

(DSE/3729-1) Avail NTIS HC A03/MF A01

The current and potential USA production capability for grain and grass crops was determined. A preliminary screening of conversion processes was performed, and as well as preliminary technical and economic feasibility analyses. The results obtained to date on biomass production, conversion processes, and data management are reported. Author (ERA)

**N77-29320#** Loughborough Univ of Technology (England)  
 Dept of Transport Technology

**ASSESSMENT OF THE ROLE OF THE LIQUEFIED PETROLEUM GAS (LPG) ENGINE IN STAGE CARRIAGE SERVICE VEHICLES**

G G Lucas Jul 1976 37 p refs  
 (TT-7605) Avail NTIS HC A03/MF A01

An assessment has been made into the viability of replacing the usual diesel engine in a public service vehicle with a spark ignition engine designed to operate on liquefied petroleum gas (LPG). The advantages of the LPG engine are less smoke, less noise, less odor, greater power for acceleration and less initial cost. The disadvantages are an increased fuel consumption in terms of miles per gallon and slightly higher emissions of carbon monoxide and unburnt hydrocarbons. The former may be alleviated however if the cost of LPG to the consumer is proportionately less than that of diesel fuel. In this the excise duty and rebate system is very important. The availability of LPG is good at present and is expected to increase over the next ten years. Author (ESA)

**N77-29323#** Federal Power Commission Washington D C  
**NATIONAL GAS SURVEY REPORT TO THE FEDERAL POWER COMMISSION BY THE SUPPLY-TECHNICAL ADVISORY TASK FORCE ON THE REGULATORY ASPECTS OF SUBSTITUTE GAS**

Dec 1976 344 p refs 2 Vol  
 (PB-265877/1) Avail NTIS HC A15/MF A01 CSCL 21D

Regulations and legislation pertaining to gas production primarily from coal gasification production primarily from coal gasification plants in the U S and Canada are discussed. Topic areas cover water and air pollution, safety and land use considerations. GRA

**N77-29324#** Federal Power Commission Washington D C  
**NATIONAL GAS SURVEY REPORT TO THE FEDERAL POWER COMMISSION BY THE SUPPLY-TECHNICAL ADVISORY COMMITTEE STUDY SUBGROUP ON RESERVES AND RESOURCES CLASSIFICATIONS**

Dec 1976 162 p refs 2 Vol  
 (PB-265878/9) Avail NTIS HC A08/MF A01 CSCL 21D

Definitions and classifications pertaining to reserve resource terms are discussed along with a survey of natural gas resources. GRA

**N77-29325#** ICF Inc Washington D C  
**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES) DOCUMENTATION VOLUME 9 ALLOCATION OF EXPLORATORY ACTIVITY TO OIL AND NATURAL GAS IN THE FEA OIL AND GAS SUPPLY MODEL**

Sep 1976 70 p refs  
 (Contract FEA-CO-05-50301-00)  
 (PB-265772/4 FEA/N-76/419-Vol-9) Avail NTIS  
 HC A04/MF A01 CSCL 10A

The methodology used to associate the finding of oil or gas with specific exploratory drilling activity is described. Numerous price specific drilling profiles are included. Each of these drilling profiles is constructed on the basis of the economics of the particular hydrocarbon and its relationship to the drilling effort. GRA

**N77-29326#** ICF, Inc., Washington, D C  
**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES) DOCUMENTATION VOLUME 13 COAL AND ELECTRIC UTILITY CONVENTIONS FOR PIES**

Sep 1976 60 p  
 (Contract FEA-CO-03-60466-00)  
 (PB-265824/3, FEA/N-76/423-Vol-13) Avail NTIS  
 HC A04/MF A01 CSCL 10A

A detailed annotated listing of the assumptions made in PIES regarding coal supply and electric utility operation is provided. The data included price assumptions for coal mines of different types and capacity figures by fuel and load type for electric utility plants. GRA

**N77-29327#** Federal Energy Administration, Washington, D C  
**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES) DOCUMENTATION VOLUME 2 PIES ECONOMETRIC DEMAND MODEL**

Sep 1976 47 p  
 (PB-265822/7, FEA/N-76/412-Vol-2) Avail NTIS  
 HC A03/MF A01 CSCL 10A

The structure of the energy demand model of the Project Independence Evaluation System is described. The demand model consists of several econometric submodels which describe regional final demand for various refined petroleum products, natural gas, electricity, and coal. The overall organization of the demand model is examined, and both the econometric results and the simulation conventions are discussed. GRA

**N77-29441** Tulsa Univ., Okla  
**DRAG REDUCTION IN COCURRENT HORIZONTAL NATURAL GAS-HEXANE PIPE FLOW** Ph D Thesis

Russell Hugh Dowling 1976 144 p  
 Avail Univ Microfilms Order No 77-6689

The drag reduction and degradation characteristics were studied as a function of pipe diameter, gas flow rate, liquid flow rate and additive concentration for the Conoco CDR and Shell PEP-4 polymers and the Dowell APE micellar type formulation. It was found that drag reduction behavior in annular-mist flow was analogous to single-phase liquid flow. Increasing friction velocity resulted in decreasing levels of drag reduction, and higher concentrations gave higher drag reductions. Furthermore, as the liquid/gas ratio increased so did the level of drag reduction up to 34% drag reduction was observed for the Dowell APE formulation at the highest liquid rates, whereas drag increases were found for liquid/gas ratios on the order of 10 B/MMscf or less. Drag reduction in two-phase annular-mist flow, which is limited to the contribution of the liquid phase to the overall two-phase pressure drop, was shown to depend on pipe size as well as liquid/gas ratio. Dissert Abstr

**N77-29451\*** Rockwell International Corp., Downey, Calif  
Space Div

**FLEXIBLE CRYOGENIC HEAT PIPE DEVELOPMENT PROGRAM Final Report**

Jul 1976 147 p refs

(Contract NAS2-8830)

(NASA-CR-152027, SD-77-AP-0088)

Avail NTIS

HC A07/MF A01 CSCL 20D

A heat pipe was designed for operation in the 100 - 200 K temperature range with maximum heat transport as a primary design goal, another designed for operation in the 15 - 100 K temperature range with maximum flexibility as a design goal. Optimum geometry and materials for the container and wicking systems were determined. The high power (100 - 200 K) heat pipe was tested with methane at 100 - 140 K, and test data indicated only partial priming with a performance limit of less than 50 percent of theoretical. A series of tests were conducted with ammonia at approximately 280 K to determine the performance under varying fluid charge and test conditions. The low temperature heat pipe was tested with oxygen at 85 - 95 K and with methanol at 295 - 315 K. Performance of the low temperature heat pipe was below theoretical predictions. Results of the completed testing are presented and possible performance limitation mechanisms are discussed. The lower-than-expected performance was felt to be due to small traces of non-condensable gases which prevented the composite wick from priming. Author

**N77-29455# Los Alamos Scientific Lab., N. Mex  
GAS-INTERFACE STUDIES IN LARGE HORIZONTAL HEAT PIPES**

J E Deverall Jan 1977 16 p

(Contract W-7405-eng-36)

(LA-6646-MS) Avail NTIS HC A02/MF A01

A series of tests was made with a large diameter, horizontal heat pipe to study the feasibility of maintaining cool zones at the ends with inert buffer gases for metal vapor laser applications. Studies were made of the slope and stability of the gas interface with both water and mercury as the working fluids. Successful operation was achieved using a buffer gas mixture for water vapor and a convection baffle system for mercury vapor. Results indicated that there is a critical heat pipe diameter, which if exceeded requires a definite gas density to establish an effective interface, but for smaller diameters, operation was independent of gas density. ERA

**N77-29519\*** Engelhard Minerals and Chemicals Corp., Edison, NJ

**DURABILITY TESTING AT ONE ATMOSPHERE OF ADVANCED CATALYSTS AND CATALYST SUPPORTS FOR AUTOMOTIVE GAS TURBINE ENGINE COMBUSTORS, PART 1 Final Report**

R M Heck, M Chang, H Hess, and R Carrubba Jun 1977 231 p refs Sponsored in part by ERDA

(Contract NAS3-19416)

(NASA-CR-135132, CONS-9416-1)

Avail NTIS

HC A11/MF A01 CSCL 21B

The durability of catalysts and catalyst supports in a combustion environment was experimentally demonstrated. A test of 1000 hours duration was completed with two catalysts, using diesel fuel and operating at catalytically supported thermal combustion conditions. The performance of the catalysts was determined by monitoring emissions throughout the test, and by examining the physical condition of the catalyst core at the conclusion of the test. The test catalysts proved to be capable of low emissions operation after 1000 hours diesel aging, with no apparent physical degradation of the catalyst support. Author

**N77-29597#** Federal Energy Administration, Washington, D C  
Strategic Petroleum Reserve Office

**STRATEGIC PETROLEUM RESERVE. SUPPLEMENT FINAL ENVIRONMENTAL IMPACT STATEMENT WEST HACKBERRY SALT DOME**

Apr 1977 350 p refs

(PB-265796/3, FEA/S-77/114-Suppl, FES-76/77-4-Suppl)

Avail NTIS HC A15/MF A01 CSCL 21D

The system assessed involves construction of a temporary surface pipeline from the site to the Amoco dock and use of the dock for interim fill, and construction of a permanent buried pipeline from the site to the Sun Terminal. This report assesses the environmental impacts caused by the construction and operation of the new components of the system. GRA

**N77-29598#** TRW, Inc., McLean, Va Energy Systems Planning Div

**THE STRATEGIC PETROLEUM RESERVE AND LIQUEFIED NATURAL GAS SUPPLIES Final Report**

R J Fink, B A Bancroft, and T M Palmieri 15 Feb 1977 83 p

(Contract FEA-CR-04-60918-00)

(PB-265488/7, FEA/S-77/123)

Avail NTIS

HC A05/MF A01 CSCL 21D

The impact which would be caused by an LNG embargo alone and a simultaneous LNG and oil embargo is analyzed. GRA

**N77-29602** Purdue Univ., Lafayette, Ind  
**APPLICATIONS OF A DOUBLY-FED INDUCTION MACHINE IN A LARGE FLYWHEEL ENERGY STORAGE SYSTEM Ph.D. Thesis**

Kongkun Hemmaplardh 1976 115 p

Avail Univ Microfilms Order No 77-7486

A doubly-fed induction machine is analyzed. The power and torque expressions are obtained. By introducing a change in the machine parameter, the possibility of constant power operation of the machine over a wide speed range is established. Steady state stability of the machine is investigated. Steady state operation of the machine over a wide speed range with no additional control involves a region of instability. Dissert Abstr

**N77-29604\*** Spectrolab, Inc., Sylmar, Calif  
**DEVELOPMENT OF STANDARDIZED SPECIFICATIONS FOR SILICON SOLAR CELLS Final Contractor Report**

John A Scott-Monck Aug 1977 83 p refs

(Contract NAS3-19440)

(NASA-CR-135233, Rept-380-6240)

Avail NTIS

HC A05/MF A01 CSCL 10A

A space silicon solar cell assembly (cell and coverglass) specification aimed at standardizing the diverse requirements of current cell or assembly specifications was developed. This specification was designed to minimize both the procurement and manufacturing costs for space qualified silicon solar cell assemblies. In addition, an impact analysis estimating the technological and economic effects of employing a standardized space silicon solar cell assembly was performed. Author

**N77-29606#** Committee on Science and Technology (U S House)

**POLAR ENERGY RESOURCES POTENTIAL**

Washington GPO 1976 192 p refs Rept for Subcomm on Energy Res. Development and Demonstration and the Subcomm on Energy Res. Development and Demonstration Fossil Fuels of the Comm on Sci and Technol. 94th Congr. 2d Sess. Sep 1976 Prepared by Library of Congr Congressional Res Service

(GPO-76-187) Avail Subcomm on Energy Res. Development and Demonstration

Of the vast known resources contained in the Arctic only the oil and gas deposits are undergoing, and are expected to continue to undergo, large scale exploitation This activity will provide incentives for continued development and refinement of polar oil and gas exploration production, and transportation technology Other polar energy resources such as coal, hydro-power, uranium, and geothermal energy while often present in enormous quantity will be utilized only locally and on a small scale Ultimate utilization of polar energy resources will be determined by the economic and energy supply conditions in temperate areas and by the degree of success of the technological advancement needed to develop resources in such remote and inhospitable regions Author

**N77-29606\*** Ball State Univ. Muncie, Ind Dept of Physics and Astronomy

**THE LINEAR FRESNEL LENS SOLAR CONCENTRATOR TRANSVERSE TRACKING ERROR EFFECTS**

Robert M Cosby Washington Aug 1977 55 p refs (Contract NCAB-00121)

(NASA-CR-2889 M-228) Avail NTIS HC A04/MF A01 CSCL 10A

The solar concentration performance of a line focusing flat base Fresnel lens in the presence of small transverse tracking errors was analyzed Solar transmittance of the lens and focal plane imaging characteristics were evaluated Transmission losses by reflectance and material absorption were also studied Author

**N77-29607\*** National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

**ANALYSIS OF REGENERATED SINGLE-SHAFT CERAMIC GAS-TURBINE ENGINES AND RESULTING FUEL ECONOMY IN A COMPACT CAR**

John L Klann and Roy C Tew Jr Washington Aug 1977 23 p refs

(NASA-TM-X-3531, E-9103) Avail NTIS HC A02/MF A01 CSCL 10B

Ranges in design and off-design operating conditions of an advanced gas turbine and their effects on fuel economy were analyzed The assumed engine incorporated a single stage radial flow turbine and compressor with fixed geometry Fuel economies were calculated over the composite driving cycle with gasoline as the fuel At a constant turbine-inlet temperature, with a regenerator sized for a full power effectiveness the best fuel economies ranged from 11.1 to 10.2 km/liter (26.2 to 22.5 mpg) for full power turbine tip speeds of 770 to 488m/sec (2530 to 1600ft/sec) respectively Author

**N77-29608\*** Hittman Associates Inc. Columbia, Md

**ENERGY UTILIZATION INDEX METHOD FOR PREDICTING BUILDING ENERGY USE VOLUME 2 PROPOSED SUPPLEMENT TO TB ENG 529 Interim Report**

L M Windingland Barry K Hinkle, and James E Piper May 1977 165 p refs 2 Vol

(Contract DACA23-76-C-0001 DA Proj 4A7-62719-AT-41) (AD-A040344 CERL-IR-E-105-Vol-2) Avail NTIS HC A08/MF A01 CSCL 13/13

This report describes development of the Energy Utilization Index (EUI) method for manually calculating monthly and annual energy consumption for buildings on military installations The method uses basic building parameters such as U-factors, dimensions, occupancy, type of HVAC equipment and average monthly weather conditions to arrive at a prediction for a buildings monthly and annual energy use Procedures for aggregating individual building consumption data into facility and installation consumption predictions are provided The method for correcting the predictions to account for actual weather conditions is also described GRA

**N77-29609\*** Battelle Pacific Northwest Labs, Richland Wash **MODELING AND OPTIMIZATION OF GEOTHERMAL POWER PLANTS USING THE BINARY FLUID CYCLE**

R A Walter Sep 1976 148 p refs (Contract E(45-1)-1830)

(BNWL-2112) Avail NTIS HC A07/MF A01

A computer simulation of a binary fluid cycle power plant for use with geothermal energy sources and the subsequent optimization of this power plant type over a range of geothermal source conditions are described The optimization technique employed for this analysis was based upon the principle of maximum use of geothermal energy ERA

**N77-29610\*** Grumman Aerospace Corp Bethpage NY Fluid Dynamics Lab

**DIFFUSER AUGMENTATION OF WIND TURBINES**

K M Foreman, B Gilbert, and R A Oman 1976 13 p refs Presented at the Joint Conf of the Am Sect of the Intern Solar Energy Soc and the Solar Energy Soc of Canada Inc Winnipeg, Canada, 15 Aug 1976

(Contract E(11-1)-2616)

(CONF-760842-6) Avail NTIS HC A02/MF A01

Wind tunnel investigation of models of two diffuser design concepts is directed toward unconventional, very short, cost-effective configurations One approach uses the energetic external wind to prevent separation of the diffuser's internal boundary layer Another method used high lift airfoil contours for the diffuser wall shape Diffuser model tests have indicated almost a doubling of wind power extraction capability for DAWTs compared to conventional turbines Economic studies of DAWTs have used these test data and recent (1975) cost projections of wind turbines with diameter ERA

**N77-29611\*** Applied Physics Lab, Johns Hopkins Univ Laurel, Md

**INTERNAL HEAT TRANSFER EXPERIMENTS IN A SIMULATED OTEC EVAPORATOR TUBE**

H L Olsen P P Pandolfini and J L Rice Nov 1976 68 p refs

(Contracts E(49-26)-1030, N00017-72-C-4401)

(APL/JHU/AEO-76-066) Avail NTIS HC A04/MF A01

Internal heat transfer tests have been conducted for ammonia in two phase flow inside a nearly horizontal aluminum tube This tube simulates one pass of a multipass evaporator tube for use in a low cost ocean thermal energy conversion plant-ship concept The tests covered mass flows, heat fluxes qualities up to 20% vapor by mass, and tube angles Stratified, wavy or intermittent flow occurred in all tests The results indicate that overall internal heat transfer coefficients essentially equivalent to the prior predictions for this heat exchanger concept are obtained in evaporators using horizontal tubes ERA

**N77-29612\*** Sandia Labs, Albuquerque, N Mex

**APPLICATION OF LAMINATED WOODEN BLADES TO A TWO-METER DARRIEUS TYPE VERTICAL AXIS WIND TURBINE**

B L Butler and Bonnie F Blackwell Dec 1976 21 p refs (Contract E(29-1)-789)

(SAND-75-0284) Avail NTIS HC A02/MF A01

The use of laminated Luan plywood in a 2-meter-diameter 3-bladed Darrieus wind turbine is described The manufacture testing and tensile stress analysis of laminated wooden blades are described The thin NACA 0012 blade was excited into resonance well below the peak power rpm and constrained the turbine to low power output The 2-meter wind turbine model tests indicated that, with appropriate blade design wood has potential for small vertical axis wind turbines ERA

**N77-29613\*** Sandia Labs Albuquerque N Mex

**SANDIA VERTICAL-AXIS WIND TURBINE PROJECT Technical Quarterly Report, 1 Apr - 30 Jun 1976**

R C Reuter, Jr ed and Robert E Sheldahl, ed Jan 1977 78 p refs

(Contract E(29-1)-789)

(SAND-76-0581) Avail NTIS HC A05/MF A01

Highlights for the quarter and status reports on activities in areas of systems studies aerodynamics electrical systems structures, and mechanical design are presented Subheadings in each section cover general development activities and activities related to the 17-meter turbine and the 5-meter turbine ERA

**N77-29614#** Southern California Gas Co Los Angeles  
**PROJECT SAGE SOLAR ASSISTED GAS ENERGY PROJECT UNITED STATES SPECIAL FORMAT REPORT**  
Aug 1976 84 p refs Sponsored by ERDA  
(DSE/4691-76/1) Avail NTIS HC A05/MF A01

The purpose is to give a preliminary description of Project SAGE, the solar assisted gas energy (SAGE) water heating system currently being tested and evaluated in Southern California A statement of the goals and objectives of the SAGE water heating program a general description of the project in addition to system performance data, evaluations and economic analyses of the various pilot studies and field test installations are reported ERA

**N77-29615#** Brookhaven National Lab Upton, N Y  
**ENERGETICS OF THE UNITED STATES OF AMERICA AN ATLAS**  
F R Drysdale and C E Calef Sep 1976 444 p  
(Contract EY-76-C-02-0016)  
(BNL-50501) Avail NTIS HC A19/MF A01

A description of the United States energy system is presented in the form of thirty-one maps and eight major tables The county has been chosen as the basic unit for reporting estimations of many energy demographic and economic variables The variables include production of all fuels (including hydroelectricity) use of fuels and electricity broken down by sector and end use existing and planned electricity generation capacity refinery capacities and emissions of air pollutants from fuel use Calculations and assumptions used to make county-level energy estimates are described in detail ERA

**N77-29616#** California Univ Livermore Lawrence Livermore Lab  
**OPTIMAL DESIGN OF ANISOTROPIC (FIBER-REINFORCED) FLYWHEELS**  
R M Christensen and E M Wu 2 Nov 1976 16 p refs  
(Contract W-7405-eng-48)  
(UCRL-52169) Avail NTIS HC A02/MF A01

An analysis is given of the kinetic energy storage capacity of anisotropic flywheels Using a uniform strain failure criteria the optimal shapes of flywheels are determined as a function of the degree of anisotropy Within this spectrum of shapes, practical design considerations are shown to favor the case where there is equal reinforcement in the radial and circumferential directions Comparisons are made between the present solid-wheel-type design and the ring design and also between candidate materials ERA

**N77-29619#** Wormser Scientific Corp, Stamford Conn  
**SOLAR HOUSE HEATING SYSTEM USING REFLECTIVE PYRAMID OPTICAL CONDENSING SYSTEM Progress Report, 1 Jun 1975 - 1 Jun 1976**  
Jul 1976 48 p  
(Contract E(11-1)-2769)  
(COO-2769-4 WSC-101-4, PR-101-4) Avail NTIS HC A03/MF A01

The effectiveness of pyramidal optics for concentrating solar energy in the heating and cooling system of a newly constructed house is assessed The installation instrumentation and operation of the self-adjusting panel is described ERA

**N77-29620#** Maschinenfabrik Augsburg-Nuernberg A G Munich (West Germany)  
**ENERGY ACCUMULATION THROUGH STATIONARY FLYWHEEL SYSTEMS Final Report**  
Otto Brandstaedter Bonn Bundesmin fuer Forsch u Technol  
Dec 1976 205 p refs In GERMAN ENGLISH summary  
Sponsored by Bundesmin fuer Forsch u Technol  
(BMFT-FB-T-76-58) Avail NTIS HC A10/MF A01 ZLDI Munich DM 42 90

General conditions for the economic use of stationary (large scale) flywheel plants were investigated Problems of construction and technical use were clarified It appears that a storage capacity of up to 10 MWh per unit may be achieved Possibilities for application exist for bulk-customers and railways The economics and financial effectiveness of a storage unit of a virtual test plant with less than 1 MWh storage capacity is demonstrated The most important result according to the state of the art, is that only the flywheel offers the possibility to store electrical energy that is consumer oriented instead of oriented only to power-plants Author (ESA)

**N77-29623#** Applied Physics Lab, Johns Hopkins Univ Laurel Md  
**ENERGY PROGRAMS AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY Quarterly Report, Oct - Dec 1976**  
Dec 1976 37 p refs Sponsored by ERDA  
(Contract N00017-72-C-4401)  
(AD-A038096, APL/JHU/EQR/76-4) Avail NTIS HC A03/MF A01 CSCL 10/1

This volume contains a record of the activities of the Applied Physics Laboratory in the development of energy sources and energy storage methods The larger number of articles describe APL activities that assist the Planning Office of the Division of Geothermal Energy (DGE) of ERDA Efforts in this field are concentrated on resource assessment and utilization in DGE Region 5 (the states east of the Rocky Mountains excluding Texas and Louisiana) The other sections describe three efforts (1) design of a Community Annual Storage Energy System (2) developmental work on polycrystalline silicon solar cells and (3) design and experimental work on a system to use ocean thermal energy Author (GRA)

**N77-29624#** Tetra Tech, Inc Arlington Va  
**ENERGY FACT BOOK, 1977**  
Apr 1977 437 p refs Supersedes TETRAT-A-642-76-254  
(Contract N00014-76-C-0239)  
(AD-A038802, TETRAT-A-642-77-306) Avail NTIS HC A19/MF A01 CSCL 10/1

The Energy Fact Book-1977 summarizes the present U S Energy situation, Energy R and D Legislation Federal Government Energy R and D, and International Energy R and D It includes a brief description of the various processes and developments related to hydrocarbon fuels, synthetic fuels, non-hydrocarbon energy sources and energy conservation Author (GRA)

**N77-29625#** State Univ of New York at Buffalo Amherst  
Dept of Electrical Engineering  
**HIGH POWER STUDY - POWER CONDITIONING Final Report, Jun 1975 - Jan 1976**  
A S Gilmour, Jr Wright-Patterson AFB Ohio AFAPL Jan 1976 174 p refs  
(Contract F30602-75-C-0122 AF Proj 3145)  
(AD-A038724, AFAPL-TR-76-101) Avail NTIS HC A08/MF A01 CSCL 10/2

This paper summarizes the power conditioning portion of the high power study that was performed for the Air Force Aero-Propulsion Laboratory by the State University of New York at Buffalo This effort defines the power conditioning system and critical component developments which will be required to interface the airborne 10 MW to 50 MW sources defined under separate study efforts with certain loads Power conditioning systems are considered for use with magnetohydrodynamic generators and turbine driven alternators, both conventional and superconducting The critical components required for each of the power conditioning systems are identified and then analyzed The component analyses include estimations of development efforts necessary and of specific weights and volumes of components The primary components considered are transformers (for alternator as well as for inverter use), switches, capacitors and inductors Weight algorithms are developed for each of the components Following the component analyses, subsystems such

as inverters and rectifier and filter packages are considered. The data for the various components and subsystems are then utilized for a comparison of the power conditioning techniques to be used with the various power sources. The weights and volumes of power conditioning systems for 8 point designs (8 variations of power, voltage, duty cycle and total run time) are derived. Finally, a development program is outlined for the critical components and subsystems. Author (GRA)

**N77-29626#** Department of Health, Education, and Welfare, Washington, D C  
**THE MARKETABILITY OF INTEGRATED ENERGY/UTILITY SYSTEMS**

Dec 1976 45 p Sponsored in part by NBS, Experimental Technology Incentives Program  
 (PB-266042/1) Avail NTIS HC A03/MF A01 CSCL 13A

A marketing guide acquaints the prospective marketplace with the potential and underlying logic of the generic Integrated Utility System (IUS) concept. A sizeable number of educational and medical facilities may well be compatible with the IUS concept and appropriate implementation of an IUS would bring about the realization of startlingly substantial annual dollar savings for the institution along with impressive energy savings. GRA

**N77-29627#** Department of Health, Education, and Welfare, Washington, D C Office of Facilities Engineering and Property Management

**INTEGRATED UTILITY SYSTEMS FEASIBILITY STUDY AND CONCEPTUAL DESIGN AT THE UNIVERSITY OF FLORIDA**

Oct 1976 170 p refs Sponsored in part by NBS Experimental Technology Incentives Program  
 (PB-266043/9) Avail NTIS HC A08/MF A01 CSCL 13A

The technical feasibility and the economic benefits of an Integrated Utility System (IUS) at the University of Florida are addressed, as are the environmental and institutional factors. The recommended IUS alternates include select energy systems wherein one fourth to three fourths of the required electrical power is generated on-site with full utilization of the waste heat from the process for heating and cooling purposes. Full integration of the systems is achieved through incineration of solid waste for its heat content, and partial reuse of the effluent from the existing sewage treatment plant for equipment make-up water and for irrigation. GRA

**N77-29628#** Department of Health Education and Welfare, Washington, D C Office of Facilities Engineering and Property Management

**INTEGRATED UTILITY SYSTEMS FEASIBILITY STUDY AND CONCEPTUAL DESIGN AT CENTRAL MICHIGAN UNIVERSITY**

Dec 1976 120 p Sponsored in part by NBS  
 (PB-266044/7) Avail NTIS HC A06/MF A01 CSCL 13A

The technical feasibility and the economic benefits of an Integrated Utility System (IUS) at Central Michigan University are addressed, as are the environmental and institutional factors. The recommended IUS incorporates a Total Energy system wherein all of the required electric power is generated on-site with full utilization of the waste heat from the power cycle for heating and cooling purposes. System integration is achieved through incineration with heat recovery of solid waste from both the University and the City of Mount Pleasant. GRA

**N77-29629#** Federal Energy Administration, Washington, D C Office of Data Analysis

**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES) DOCUMENTATION. VOLUME 15 STANDARD DATA TABLES FOR PIES**

Sep 1976 288 p  
 (PB-265195/8, FEA/N-77/116) Avail NTIS  
 HC A13/MF A01 CSCL 10A

The standard tables given are an adjunct to the documentation of the Project Independence Evaluation System. The standard tables provide a rigid format for the presentation of data to be used in generation of the linear program matrix. The tables are the synthesis of all raw data used in the matrix after arithmetic

operations have been performed. In general, there are three categories of standard tables: facilities, materials, and transportation. Units for each entry are in standard PIES physical quantities. GRA

**N77-29630#** ICF, Inc. Washington, D C  
**PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES) DOCUMENTATION. VOLUME 8 METHODOLOGY FOR ENABLING THE PIES OIL AND GAS SUPPLY CURVES TO RESPOND TO NON-CONSTANT PRICES**

Sep 1976 42 p  
 (Contract FEA-CO-05-50301-00)  
 (PB-265086/9, FEA/N-76/418) Avail NTIS  
 HC A03/MF A01 CSCL 10A

The possibility is discussed of increased capability of the FEA oil and supply modelling system to respond to non-constant price trajectories rather than constant, instantaneous patterns. More specifically, it investigates the efficacy of enabling the FEA oil and gas supply models to respond to prices that are ramped, especially in the short run. GRA

**N77-29632#** Environmental Protection Agency Washington, D C Office of Energy, Minerals and Industry  
**WESTERN ENERGY/ENVIRONMENT MONITORING STUDY: PLANNING AND COORDINATION SUMMARY**

Gregory J Dalessio Mar 1977 25 p  
 (PB-266256/7, EPA-600/7-77-024) Avail NTIS  
 HC A02/MF A01 CSCL 10A

The planning, coordination and implementation mechanisms which provide the framework for the Western Energy/Environment Monitoring Study are summarized. This study is a segment of the Interagency Energy/Environment Research and Development Program administered by EPA. GRA

**N77-29633#** Commerce Dept Washington D C Domestic and International Business Administration  
**FORECAST OF LIKELY US ENERGY SUPPLY/DEMAND BALANCES FOR 1985 AND 2000, AND IMPLICATIONS FOR US ENERGY POLICY**

Joseph F Gustafro 20 Jan 1977 174 p refs  
 (PB-266240/1, DIBA/EAD-77/1) Avail NTIS  
 HC A07/MF A01 CSCL 10A

Future U S energy balances based on a 1.2% per capita energy growth rate are projected. These balances take into account declining U S and world oil and gas reserves and limitations on fuel substitutability. GRA

**N77-29634#** California Univ., Los Angeles Dept of Chemical, Nuclear, and Thermal Engineering  
**A PARAMETRIC UTILITY COMPARISON OF COAL AND NUCLEAR ELECTRICITY GENERATION**

Kenneth M Maurer Feb 1977 72 p refs  
 (Grant NSF OEP-75-20318)  
 (PB-266064/5, UCLA-ENG-7719, NSF/RA-770056) Avail  
 NTIS HC A04/MF A01 CSCL 10B

The advantages and limitations of an explicit quantitative model for decision making are discussed. Several different quantitative models are presented, noting that the use of an expected utility maximization decision rule allows both the direct incorporation of multidimensional descriptions of the possible outcomes, and considerations of risk averse behavior. A broad class of utility functions, characterized by linear risk tolerance was considered and extended to a multidimensional form. GRA

**N77-29635#** Westinghouse Research Labs., Pittsburgh, Pa  
**THIN FILM SOLAR CELLS FOR TERRESTRIAL APPLICATIONS. Final Report, 1 Aug 1974 - 31 Jul 1976**

F A Shirland, W J Biter, E W Greeneich, A J Simon, and T P Brody Feb 1977 103 p refs  
 (Grant NSF AER-74-14918-A01)  
 (PB-265983/7, Rept-77-9F9-TFSOL-RI) Avail NTIS  
 HC A06/MF A01 CSCL 10B

A design has evolved from an earlier space cell which is promising for large scale terrestrial use. This is a front wall cell.



on zinc plated copper foil substrate with an evaporated grid and an integral glass cover formed by rf sputtering. This cell is suitable for low cost mass fabrication. Though it has not been fully proven it combines the constructional features that showed maximum stability in operation in the past. A standard process laboratory line was operated with fixed process parameters for 14 months. Over this period cell efficiency averaged 4.9% with an 81% yield. Earlier space cells were encapsulated to protect them from the atmosphere and subjected to accelerated life tests. They showed no loss of output after 20 months of 50% daily duty cycles at operating temperatures of 40C, 60C, and 80C. Cells operated at 100C showed an 11% loss of output over the 20 months of accelerated use which is attributed to diffusion of copper from the Cu<sub>2</sub>S into the CdS. GRA

**N77-29636#** Association of Physical Plant Administrators of Univ and Coll., Washington, D C  
**ENERGY CONSERVATION ON CAMPUS VOLUME 1: GUIDELINES**  
Dec 1976 42 p 2 Vol  
(Contract FEA-CO-04-50247-00)  
(PB-266211/2, FEA/D-76/229) Avail NTIS  
HC A03/MF A01 CSCL 13A

The development of a campus energy management program including policy elements, formation of an energy management committee, appointment of an energy management officer, and measuring and evaluating the energy use of campus buildings is discussed. Various areas in which reductions in energy consumption are possible are noted. Checklists of specific energy conservation actions to be taken in the major areas are presented along with samples of various energy information and survey forms. GRA

**N77-29637#** Association of Physical Plant Administrators of Univ and Coll., Washington, D C  
**ENERGY CONSERVATION ON CAMPUS VOLUME 2 CASE STUDIES**  
Dec 1976 35 p 2 Vol  
(Contract FEA-CO-04-50247-00)  
(PB-266212/0, FEA/D-76/230) Avail NTIS  
HC A03/MF A01 CSCL 13A

Case studies covering examples of various energy conservation actions taken on college and university campuses across the country and in Canada along with the resulting costs savings are reported. GRA

**N77-29638#** Lockheed Missiles and Space Co., Huntsville, Ala  
**HEAT PUMPS, SUBSTITUTES FOR OUTMODDED FOSSIL-FUELED SYSTEMS** Final Report, Apr - Jun, 1976  
E A Picklesimer Apr 1977 39 p refs  
(Contract EPA-68-02-1331)  
(PB-266218/7, LMSC-HREC-PR-D496880, EPA-600/7-77-035) Avail NTIS HC A03/MF A01 CSCL 13A

The state-of-the-art is reviewed relative to development, capacity, and adequacy of the heat pump as a potential replacement for outmodded fossil-fueled heating and cooling systems in the residential and commercial sector. Projections are made of the rate at which heat pumps need to be manufactured and installed in the commercial and residential sectors as the projected service life of fossil-fuel equipment expires. The conclusion is reached that the heat pump is economical only as a total space comfort system. Based on January 1, 1976, fuel prices, the heat pump is about 25% more expensive to operate than comparable fossil-fuel heating systems. If the trend of increasing fuel prices continues, the heat pump will be more economical to operate than comparable fossil-fueled heating systems by 1980. GRA

**N77-29640#** Mitre Corp., McLean, Va Metrek Div  
**ANALYSIS OF ENERGY PROJECTIONS FOR INFRASTRUCTURE DEVELOPMENT REQUIREMENTS** Final Report

John G Leigh Feb 1977 80 p refs  
(Contract DOT-FH-11-9209)  
(PB-266419/1, MTR-7455) Avail NTIS HC A05/MF A01 CSCL 10A

Current energy models and projections are surveyed. Four are analyzed in detail to provide a basis for projecting infrastructure and highway development needs associated with energy production. GRA

**N77-29655#** Argonne National Lab., Ill  
**THE ENVIRONMENTAL EFFECTS OF USING COAL FOR GENERATING ELECTRICITY**  
C D Brown, E H Dettman, R A Hinchman, J D Jastrow, and F C Kornegay May 1977 227 p refs  
(Contract W-31-109-eng-38)  
(PB-267237/6, NUREG-0252) Avail NTIS HC A11/MF A01 CSCL 13B

The identification of health and ecological impacts of using coal for generating electrical power requires an understanding of the entire coal cycle, which can be described chronologically as extraction - processing - transportation - combustion - waste. Each segment of the cycle is described, with emphasis placed on those topics where potential health and ecological impacts may occur. Underground and surface mining, coal processing, and transportation including rail, barge, slurry pipeline, truck, and conveyor are described. The combustion, combustion wastes, and airborne combustion emissions are predicted for a model 1000-MWe coal-fired power plant. The description of this plant includes ancillary structures, daily and annual fuel requirements assuming a 70% capacity factor, coal storage piles, and wastes generated. GRA

**N77-29770\*#** Martin Marietta Corp., Denver, Colo  
**THE ASSEMBLY OF LARGE STRUCTURES IN SPACE**  
George W Smith and Shepard B Brodie /n JPL The 2nd Conf on Remotely Manned Systems (RMS) Jun 1975 p 43-44

Contracts NAS9-14319, NAS3-17835  
Avail NTIS HC A06/MF A01 CSCL 05H  
Techniques developed for orbital assembly of the support structure for a 1000 meter diameter microwave power transmission system antenna are described. The operation is performed in two phases using the shuttle remote manipulator system in low earth orbit, and a mobile assembler in geosynchronous orbit. Author

**N77-29946\*#** Ball State Univ., Muncie, Ind Dept of Physics and Astronomy  
**SOLAR CONCENTRATION BY CURVED-BASE FRESNEL LENSES**  
Ronald M Cosby Aug 1977 68 p refs  
(NCA8-00127)  
(NASA-CR-2890, M-229) Avail NTIS HC A04/MF A01 CSCL 20F

The solar concentration performance of idealized curved base line focusing Fresnel lenses is analyzed. A simple optical model was introduced to study the effects of base curvature and lens f-number. Thin lens ray tracing and the laws of reflection and refraction are used to develop expression for lens transmittance and image plane intensity profiles. The intensity distribution over the solar spectrum, lens dispersion effects, and absorption by the lens material are included in the analysis. Model capabilities include assessment of lens performance in the presence of small transverse tracking errors and the sensitivity of solar image characteristics to focusing. Author

**N77-30027#** Brookhaven National Lab., Upton, N Y  
**INPUT-OUTPUT CAPITAL COEFFICIENTS FOR ENERGY TECHNOLOGIES**  
R G Tessmer, Jr Dec 1976 32 p refs  
(Contract EY-76-C-02-0016)  
(BNL-50608) Avail NTIS HC A03/MF A01  
Input-output capital coefficients are presented for five electric and seven nonelectric energy technologies. They describe

the durable goods and structures purchases (at a 110 sector level of detail) that are necessary to expand productive capacity in each of twelve energy source sectors. Coefficients are defined in terms of 1967 dollar purchases per million Btu of output from new capacity, and original data sources include Battelle Memorial Institute, the Harvard Economic Research Project, The Mitre Corp., and Bechtel Corp. The twelve energy sectors are coal, crude oil and gas, shale oil, methane from coal, solvent refined coal, refined oil products, pipeline gas, coal combined-cycle electric, fossil electric, LWR electric, HTGR electric, and hydroelectric ERA

**N77-30151\*** McDonnell-Douglas Astronautics Co., Huntington Beach, Calif

**SPACE STATION SYSTEMS ANALYSIS STUDY PART 3: DOCUMENTATION, VOLUME 1 EXECUTIVE SUMMARY**

Jul 1977 47 p refs

(Contract NAS9-14958)

(NASA-CR-151503, MDC-G6922-Pt-3-Vol-1) Avail NTIS HC A03/MF A01 CSCL 22A

The space stations systems analysis study is summarized. A cost effective system concept capable of meeting a broad spectrum of mission requirements was developed. Candidate objectives were reviewed and implementation requirements were defined. Program options for both low earth and geosynchronous orbits were examined. Space construction concepts were analyzed and defined in detail. B B

**N77-30255\*** Battelle Columbus Labs, Ohio  
**EVALUATION OF THE CALCIUM ALUMINATE BOND PHASE IN REFRACTORY CASTABLES AS RELATED TO THEIR USE IN SYNTHANE GASIFIER**

D R Lankard, J H Peterson, and C W Kistler Dec 1976 72 p refs

(Contracts Di-BM-JO-155086, E(49-18)-2219)

(PB-266854/9, BM-OFR-85-77) Avail NTIS HC A04/MF A01 CSCL 11B

The effects of exposing a dense, high alumina castable and a low iron insulating castable to a simulated coal gasification reactor environment for up to 100 hours and at temperatures up to 2,000F are described. The castables were characterized by chemical analyses, X-ray diffraction, scanning electron microscopy, and strength measurements. Changes in the castables were related to mineralogical and microstructural changes. GRA

**N77-30259** Wayne State Univ., Detroit, Mich  
**AN EXPERIMENTAL STUDY SUPPORTED BY A COMPUTER SIMULATION IN A PRECHAMBER CFR DIESEL ENGINE LEADING TO A MODIFIED CETANE SCALE FOR RATING LOW IGNITION QUALITY FUELS** Ph.D Thesis

Nabil Youssef Elias 1976 319 p

Avail Univ Microfilms Order No 77-9392

The current ASTM cetane scale was investigated as a criterion to rate low ignition quality diesel fuels. An evaluation of the effect of raising compression ratio on gas temperature indicated that while the increase in compression ratio beyond a critical ratio greatly affects the pressure, it has an insignificant effect on gas temperature. A study of the effect of gas pressure and temperature on ignition delay period showed that the effect of increasing the gas temperature on ignition delay was much more than the effect of increasing the gas pressure. It was concluded that raising compression ratio does not extend the current cetane scale for C/N below 15. Dissert Abstr

**N77-30261\*** RAND Corp., Santa Monica, Calif  
**THE POTENTIAL ROLE OF TECHNOLOGICAL MODIFICATIONS AND ALTERNATIVE FUELS IN ALLEVIATING AIR FORCE ENERGY PROBLEMS** Interim Report

J R Gebman, W L Stanley, J P Weyant, and W T Mikolowsky Dec 1976 170 p refs

(Contract F49620-77-C-0023)

(AD-A039597, R-1829-PR) Avail NTIS HC A08/MF A01 CSCL 21/4

This report examines short- and long-term measures to reduce the consumption of petroleum jet fuels by the Air Force. Engine retrofits and aerodynamic modifications to existing aircraft can save significant quantities of jet fuel, however, savings in fuel expenditures are not enough to offset high initial costs of engine retrofits. If accomplished early in an aircraft's life cycle, relatively lower costs of modest aerodynamic modifications may be recoverable through savings in fuel expenditures. Synthetic JP fuels derived from oil shale or coal appear to be the most attractive future alternatives to petroleum jet fuels. If the foreign oil cartel maintains its price-setting effectiveness and synthetic fuels industry develops in the United States, development of an Air Force capability to interchangeable use fuels derived from crude oil, oil shale, or coal could be economically attractive and enhance the Air Force's position in the jet fuel marketplace.

Author (GRA)

**N77-30273\*** National Aeronautics and Space Administration  
Marshall Space Flight Center, Huntsville, Ala

**PROCEEDINGS OF THE ASPE/MSFC SYMPOSIUM ON ENGINEERING AND PRODUCTIVITY GAINS FROM SPACE TECHNOLOGY**

May 1977 279 p Conf proc held at Huntsville, Ala 11-12 May 1977

(NASA-CP-2019) Avail NTIS HC A13/MF A01 CSCL 05A

Aerospace technology findings were examined in regard to nonaerospace applications. Studies of energy generation, materials and processes, earth observation as well as advances and benefits of electronics are included.

**N77-30274\*** National Aeronautics and Space Administration  
Marshall Space Flight Center, Huntsville, Ala

**ERDA/NASA-MSFC SOLAR HEATING AND COOLING DEVELOPMENT AND DEMONSTRATION PROGRAM**

John M Price. In: *Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol* May 1977 p 9-17

Avail NTIS HC A13/MF A01 CSCL 10A

The role of the Manned Space Flight Center (MSFC) in the National Solar Heating and Cooling program is evaluated. The responsibilities of the MSFC within this program are (1) to manage the development and testing of solar heating and cooling systems leading to marketable products, (2) to develop data acquisition equipment supporting a national data program, and (3) to manage and collect data from commercial demonstration sites. MSFC test facilities and demonstration sites are described. J H

**N77-30275\*** Alabama Power Co., Birmingham  
**IMPACT OF ALTERNATIVE ENERGY FORMS ON PUBLIC UTILITIES**

F W Keith, Jr. In: *NASA Marshall Space Flight Center Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol* May 1977 p 19-31

Avail NTIS HC A13/MF A01 CSCL 10A

The investigation of alternative energy sources by the electric utility industry is discussed. Research projects are reviewed in each of the following areas: solar energy, wind energy conversion, photosynthesis of biomass, ocean thermal energy conversion, geothermal energy, fusion, and the environmental impact of alternative energy sources. J H

**N77-30276\*** General Electric Co., Philadelphia, Pa  
Space Div

**WIND ENERGY: A RENEWABLE ENERGY OPTION**

James S Zimmerman. In: *NASA Marshall Space Flight Center Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol* May 1977 p 33-68

Avail NTIS HC A13/MF A01 CSCL 10A

Wind turbine generator research programs administered by the Energy Research and Development Administration are examined. The design and operation of turbine demonstration models are described. Wind assessments were made to determine

**N77-30277**

the feasibility of using wind generated power for various parts of the country J H

**N77-30277\*#** National Aeronautics and Space Administration  
Lewis Research Center Cleveland Ohio

**RECENT DEVELOPMENTS IN PHOTOVOLTAIC ENERGY BY ERDA/NASA-LERC**

James N Deyo *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 69-85*

Avail NTIS HC A13/MF A01 CSCL 10A

Application development activities were designed to stimulate the market for photovoltaics so that as costs are reduced there will be an increasing market demand to encourage the expansion of industrial solar array production capacity Supporting these application development activities are tasks concerned with (1) establishing standards and methodology for terrestrial solar cell calibration (2) conducting standard and diagnostic measurements on solar cells and modules and (3) conducting real time and accelerated testing of solar cell modules and materials of construction under outdoor sunlight conditions J H

**N77-30278\*#** Energy Research and Development Administration,  
Washington D C Ocean Systems Branch

**OCEAN THERMAL ENERGY CONVERSION (OTEC)**

Abraham Lavi *In NASA Marshall Space Flight Center Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 87-94*

Avail NTIS HC A13/MF A01 CSCL 10A

Energy Research and Development Administration research progress in Ocean Thermal Energy Conversion (OTEC) is outlined The development program is being focused on cost effective heat exchangers ammonia is generally used as the heat exchange fluid Projected costs for energy production by OTEC vary between \$1000 to \$1700 per kW J H

**N77-30279\*#** Martin Marietta Corp., Denver Colo  
**ERDA'S CENTRAL RECEIVER SOLAR THERMAL POWER SYSTEM STUDIES**

Lester J Lippy and Thomas R Heaton *In NASA Marshall Space Flight Center Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 95-123 refs*

Avail NTIS HC A13/MF A01 CSCL 10A

The utilization of solar energy for electrical power production was studied Efforts underway on the central receiver solar thermal power system are presented Preliminary designs are included of pilot plant utilizing large numbers of heliostats in a collector field Safety hazards are also discussed, as well as the most beneficial location of such a plant within the United States B L P

**N77-30286\*#** National Aeronautics and Space Administration  
Marshall Space Flight Center, Huntsville, Ala

**PROCESSING ON HIGH EFFICIENCY SOLAR COLLECTOR COATINGS**

Marion Roberts *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 171-176*

Avail NTIS HC A13/MF A01 CSCL 11D

Wavelength selective coatings for solar collectors are considered Substrates with good infrared reflectivity were examined along with their susceptibility to physical and environmental damage Improvements of reflective surfaces were accomplished through buffing, chemical polishing and other surface processing methods B L P

**N77-30289\*#** National Aeronautics and Space Administration  
Goddard Inst for Space Studies, New York

**SPACE TECHNOLOGY IN THE DISCOVERY AND DEVELOPMENT OF MINERAL AND ENERGY RESOURCES**

Paul D Lowman *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977*

p 197-199 refs

Avail NTIS HC A13/MF A01 CSCL 08G

Space technology, applied to the discovery and extraction of mineral and energy resources, is summarized Orbital remote sensing for geological purposes has been widely applied through the use of LANDSAT satellites These techniques also have been of value for protection against environmental hazards and for a better understanding of crustal structure B L P

**N77-30293\*#** National Aeronautics and Space Administration  
Marshall Space Flight Center, Huntsville Ala

**USE OF HEAT PIPES IN ELECTRONIC HARDWARE**

James R Graves *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 249-255*

Avail NTIS HC A13/MF A01 CSCL 09C

A modular multiple output power converter was developed in order to reduce costs of space hardware in future missions The converter is of reduced size and weight and utilizes advanced heat removal techniques in the form of heat pipes which remove internally generated heat more effectively than conventional methods B L P

**N77-30294\*#** National Aeronautics and Space Administration  
Marshall Space Flight Center, Huntsville, Ala

**SPACE POWER TECHNOLOGY APPLIED TO THE ENERGY PROBLEM**

J L Miller and J R Morgan *In its Proc of the ASPE/MSFC Symp on Eng and Productivity Gains from Space Technol May 1977 p 257-269 refs*

Avail NTIS HC A13/MF A01 CSCL 10A

A solution to the energy problem is suggested through the technology of photovoltaic electrolysis of water to generate hydrogen Efficient solar devices are discussed in relation to available solar energy and photovoltaic energy cost It is concluded that photovoltaic electrolytic generation of hydrogen will be economically feasible in 1985 B L P

**N77-30314\*#** National Aeronautics and Space Administration  
Lewis Research Center Cleveland Ohio

**STATISTICS OF THE RADIATED FIELD OF A SPACE-TO-EARTH MICROWAVE POWER TRANSFER SYSTEM**

Grady H Stevens and Gary Leininger (Toledo Univ Ohio) [1976] 39 p refs

(NASA-TM-X-73684 E-9217) Avail NTIS HC A02/MF A01 CSCL 20N

Statistics such as average power density pattern, variance of the power density pattern and variance of the beam pointing error are related to hardware parameters such as transmitter rms phase error and rms amplitude error Also a limitation on spectral width of the phase reference for phase control was established A 1 km diameter transmitter appears feasible provided the total rms insertion phase errors of the phase control modules does not exceed 10 deg amplitude errors do not exceed 10% rms, and the phase reference spectral width does not exceed approximately 3 kHz With these conditions the expected radiation pattern is virtually the same as the error free pattern and the rms beam pointing error would be insignificant (approximately 10 meters) Author

**N77-30373#** Army Electronics Technology and Devices Lab  
Fort Monmouth N J

**A HALF MEGAWATT PULSE FORMING NETWORK (PFN)**

J E Creedon and R A Fitch (Maxwell Labs San Diego, Calif)

Apr 1977 9 p

(DA Proj 1L7-62705-A-1194)

(AD-A039709, ECOM-4494) Avail NTIS HC A02/MF A01

CSCL 10/3

A lightweight half megawatt average power pulse forming network (PFN) designed a store 4 kilojoules (kJ) at 40 kilovolts has been developed The energy storage system produces a 10 microsecond pulse at a repetition rate of 125 hertz and has a one ohm impedance It is designed to operate adiabatically for durations of 60 seconds A lifetime capability of over 400 000 pulses has been demonstrated Author (GRA)

**N77-30415\*#** Dynatherm Corp Cockeysville, Md  
**DEVELOPMENT OF A JET PUMP-ASSISTED ARTERIAL HEAT PIPE Final Report**

Walter B Bienert Amon S Ducao, and Donald S Trimmer 6 May 1977 55 p refs  
 (Contract NAS2-9233)  
 (NASA-CR-152015, DTM-77-2) Avail NTIS  
 HC A04/MF A01 CSCL 20D

The development of a jet pump assisted arterial heat pipe is described. The concept utilizes a built-in capillary driven jet pump to remove vapor and gas from the artery and to prime it. The continuous pumping action also prevents depriming during operation of the heat pipe. The concept is applicable to fixed conductance and gas loaded variable conductance heat pipes. A theoretical model for the jet pump assisted arterial heat pipe is presented. The model was used to design a prototype for laboratory demonstration. The 1.2 m long heat pipe was designed to transport 500 watts and to prime at an adverse elevation of up to 1.3 cm. The test results were in good agreement with the theoretical predictions. The heat pipe carried as much as 540 watts and was able to prime up to 1.9 cm. Introduction of a considerable amount of noncondensable gas had no adverse effect on the priming capability. Author

**N77-30531\*#** National Aeronautics and Space Administration  
 Lewis Research Center, Cleveland, Ohio  
**CONSIDERATION OF DESIGN AND CALIBRATION OF TERRESTRIAL REFERENCE SOLAR CELLS**

V G Weizer *In its* Terrest Photovoltaic Meas 2 1976 p 203-222 refs  
 Avail NTIS HC A17/MF A01 CSCL 10A

A discussion is presented on the problems encountered in the design of a reference cell that meets basic criteria starting with basic design considerations and proceeding with the precautions taken to ensure a global monitoring capability. The effects of the variations in atmospheric conditions on the calibration and use of reference cells are presented along with a discussion of the simplifications brought about by the use of spectrally matched test and reference cells. Finally, a method of matching test modules and arrays to reference cells by a red/blue response ratio technique is described. Author

**N77-30534\*#** National Aeronautics and Space Administration  
 Lewis Research Center, Cleveland, Ohio  
**SENSITIVITY OF SOLAR CELL PERFORMANCE TO ATMOSPHERIC VARIABLES 1 SINGLE CELL**

Thomas M Klucher *In its* Terrest Photovoltaic Meas 2 1976 p 247-258 refs

The short circuit current of a typical silicon solar cell under direct solar radiation was measured for a range of turbidity, water vapor content, and air mass to determine the relation of the solar cell calibration value (current-to-intensity ratio) to those atmospheric variables. A previously developed regression equation was modified to describe the relation between calibration value, turbidity, water vapor content, and air mass. Based on the value of the constants obtained by a least squares fit of the data to the equation, it was found that turbidity lowers the value, while increase in water vapor increases the calibration value. Cell calibration values exhibited a change of about 6% over the range of atmospheric conditions experienced. Author

**N77-30537\*#** Laboratoires d'Electronique et de Physique Appliquee, Paris Lmeil-Brevannes (France)

**CELL AND MODULE TEST PROCEDURES SEEN FROM THE MANUFACTURER AND THE USER POINT OF VIEW**

Henry Durand *In NASA* Lewis Res Center Terrest Photovoltaic Meas 2 1976 p 301-308

Avail NTIS HC A17/MF A01 CSCL 10A

The problems encountered by manufacturers and users of solar modules are summarized. Related measurement of the rated power of the module is included, and a temperature test is suggested to define the actual performance of a module. Other suggestions are given for environmental module and array tests. B B

**N77-30539\*#** Royal Aircraft Establishment, Farnborough (England)

**RECOMMENDATIONS FOR THE PERFORMANCE RATING OF FLAT PLATE TERRESTRIAL PHOTOVOLTAIC SOLAR PANELS**

F C Treble *In NASA* Lewis Res Center Terrest Photovoltaic Meas 2 1976 p 323-336 refs

Avail NTIS HC A17/MF A01 CSCL 10A

A review of recommendations for standardizing the performance rating of flat plate terrestrial solar panels is given to develop an international standard code of practice for performance rating. Required data to characterize the performance of a solar panel are listed. Other items discussed are (1) basic measurement procedures (2) performance measurement in natural sunlight and simulated sunlight (3) standard solar cells (4) the normal incidence method, (5) global method and (6) definition of peak power. B B

**N77-30540\*#** Sandia Labs, Albuquerque, N Mex  
**SILICON SOLAR CELL TESTING IN CONCENTRATED SUNLIGHT AND SIMULATED SUNLIGHT**

E L Burgess and K W Mitchell *In NASA* Lewis Res Center Terrest Photovoltaic Meas 2 1976 p 337-354 refs Sponsored by ERDA

Avail NTIS HC A17/MF A01 CSCL 10A

A method is described for testing silicon solar cells in concentrated sunlight and simulated sunlight. Concentrated sunlight is obtained by using an acrylic Fresnel lens. The simulated sunlight source is a short arc Xenon lamp. Average illumination levels during the tests are inferred from an assumed linear relationship between short circuit current and illumination. The linearity assumption is investigated for 0.3 alpha cm base resistivity silicon cells and found to be valid. Some typical results are presented to illustrate the type of information obtained during the testing. Author

**N77-30589#** Bureau of Mines, Pittsburgh, Pa Mining and Safety Research Center

**METHODS OF DETERMINING THE ORIENTATIONS OF BEDROCK FRACTURE SYSTEMS IN SOUTHWESTERN PENNSYLVANIA AND NORTHERN WEST VIRGINIA**

B M Bench W P Diamond, and C M McCulloch 1977 52 p refs  
 (PB-266769/9, BM-RI-8217) Avail NTIS HC A04/MF A01 CSCL 08I

Photolineaments from stereoscopic examination of vertical aerial photographs and those found by the Ronchi grating study of aerial photoindex sheets are described and discussed. They are compared with the trends of oriented fracture systems procured by measuring the compass direction of joints in bedrock. The relative reliability of the methods is shown, and the results are presented in graphical, tabular and written form. Analyses of field measurements of strikes of bedrock joints in the project area indicate for the most part two intersecting sets of major joints oriented N 76 degrees W - N 15 degrees E and N 57 degrees W - N 27 degrees E. The analyses of lineaments determined by stereoscopic examination of aerial photographs show dominant trends of lineament zones of weakness to be an average on N 65 degrees W - N 20 degrees E. Analysis of lineaments found by Ronchi grid viewing of aerial photoindex sheets indicate dominant trends of N 70 degrees W - N 27 degrees E. GRA

**N77-30598\*#** National Aeronautics and Space Administration  
 Lewis Research Center, Cleveland, Ohio

**EVALUATION OF PHASE 2 CONCEPTUAL DESIGNS AND IMPLEMENTATION ASSESSMENT RESULTING FROM THE ENERGY CONVERSION ALTERNATIVES STUDY (ECAS)**

Apr 1977 605 p refs  
 (Contract E(49-18)-1751)  
 (NASA-TM-73515 E-8596) Avail NTIS HC A99/MF A01 CSCL 10B

Advanced systems using coal and coal-derived fuels for base-load electric power generation were compared. The study

was conducted in two phases. Phase 1 consisted of a parametric analysis. From these results 11 concepts were selected for further study in Phase 2. For each of the Phase 2 systems and a common set of ground rules, the performance, cost, environmental intrusion, and natural resource requirements were estimated. In addition, the contractors defined the state of technology, identified advances required, and prepared preliminary research and development plans and an implementation assessment. The systems studied in Phase 2 include steam systems with atmospheric- and pressurized-fluidized-bed boilers combined gas turbine/steam systems with integrated gasifiers or fired by a semiclean coal-derived fuel, a potassium/steam system with a pressurized-fluidized-bed boiler, a closed-cycle gas turbine/organic system with a high-temperature, atmospheric-fluidized-bed furnace, a direct-coal-fired open-cycle magnetohydrodynamic/steam system, and a molten carbonate fuel cell/steam system with integrated gasifier. The Phase 2 results are summarized and compared and presented together with NASA analysis and evaluation. The common ground rules specified for the study are presented. The sensitivity of the results to changes in the ground rules and the impact of uncertainties in capital cost estimates are examined. Author

**N77-30599\*#** National Aeronautics and Space Administration  
Lewis Research Center, Cleveland, Ohio  
**DYNAMIC BLADE LOADING IN THE ERDA/NASA 100 kW  
AND 200 kW WIND TURBINES**

D. A. Spera, D. C. Janetzke, and T. R. Richards. Aug 1977. 16 p. refs. Presented at the Natl Conf of the Am Wind Energy Assoc, Boulder, Colo., 11-14 May 1977. (Contract E(49-26)-1004). (NASA-TM-73711, ERDA/NASA-1004-77/2 E-9242). Avail NTIS HC A02/MF A01 CSCL 10A.

Dynamic blade loads, including aerodynamic, gravitational, and inertial effects, are presented for two large horizontal-axis wind turbines: the ERDA-NASA 100 kW Mod-0 and 200 kW Mod-0A wind power systems. Calculated and measured loads are compared for an experimental Mod-0 machine in operation. Predicted blade loads are also given for the higher power Mod-0A wind turbine now being assembled for operation as part of a municipal power plant. Two major structural modifications have been made to the Mod-0 wind turbine for the purpose of reducing blade loads. A stairway within the truss tower was removed to reduce the impulsive aerodynamic loading caused by the tower wake on the downwind rotor blades. Also, the torsional stiffness of the yaw drive mechanism connecting the turbine nacelle to the tower was doubled to reduce rotor-tower interaction loads. Measured reductions in load obtained by means of these two modifications equaled or exceeded predictions. Author

**N77-30604\*#** Solarex Corp., Rockville, Md.  
**ENERGY REQUIREMENT FOR THE PRODUCTION OF  
SILICON SOLAR ARRAYS** Quarterly Report, 21 Mar -  
20 Jun 1977

Joseph Lindmayer, Manfred Wihl, Alan Scheinne, and Andrew Morrison. Jul 1977. 61 p. refs. Sponsored in part by ERDA. Prepared for JPL. (Contracts NAS7-100, JPL-954606). (NASA-CR-153409, ERDA/JPL-954606-77/1, SX/111/2Q, QR-2). Avail NTIS CSCL 10A.

Photovoltaics is subject of an extensive technology assessment in terms of its net energy potential as an alternate energy source. Reduction of quartzite pebbles refinement, crystal growth, cell processing and panel building are evaluated for energy expenditure compared to direct, indirect, and overhead energies. Author

**N77-30605\*#** Sensor Technology, Inc., Chatsworth, Calif.  
**DEVELOPMENT OF LOW COST, HIGH ENERGY-PER-UNIT-  
AREA SOLAR CELL MODULES** Quarterly Report, 1 Apr. -  
30 Jun 1977

Gregory T. Jones and Sanjeev Chitre. Jun 1977. 59 p. Sponsored in part by ERDA. Prepared for JPL. (Contracts NAS7-100, JPL-954605). (NASA-CR-153977, ERDA/JPL-954605-77/2, QR-2). Avail NTIS HC A04/MF A01 CSCL 10A.

Work on the development of low cost high energy per unit area solar cell modules was conducted. Hexagonal solar cell and module efficiencies, module packing ratio, and solar cell design calculations were made. The cell grid structure and interconnection pattern was designed and the module substrates were fabricated for the three modules to be used. It was demonstrated that surface macrostructures significantly improve cell power output and photovoltaic energy conversion efficiency. Author

**N77-30606\*#** Dow Corning Corp., Hemlock, Mich.  
Solid-State Research and Development Lab  
**SOLAR SILICON VIA IMPROVED AND EXPANDED  
METALLURGICAL SILICON TECHNOLOGY** Quarterly Report,  
Apr - Jun 1977

L. P. Hunt, V. D. Dosaj, and J. R. McCormick. Jul 1977. 87 p. refs. Sponsored in part by ERDA. Prepared for JPL. (Contracts NAS7-100, JPL-954559). (NASA-CR-153415, ERDA/JPL-954559-77/2, QR-4). Avail NTIS HC A05/MF A01 CSCL 10A.

A completed preliminary survey of silica sources indicates that sufficient quantities of high-purity quartz are available in the U.S. and Canada to meet goals. Supply can easily meet demand for this little-sought commodity. Charcoal, as a reductant for silica, can be purified to a sufficient level by high-temperature fluorocarbon treatment and vacuum processing. High-temperature treatment causes partial graphitization which can lead to difficulty in smelting. Smelting of Arkansas quartz and purified charcoal produced kilogram quantities of silicon having impurity levels generally much lower than in MG-Si. Half of the goal was met of increasing the boron resistivity from 0.03 ohm-cm in metallurgical silicon to 0.3 ohm-cm in solar silicon. A cost analysis of the solidification process indicates \$350-725/kg Si for the Czochralski-type process and \$150-425/kg Si for the Bridgman-type technique. Author

**N77-30608\*#** Barry (Theodore) and Associates, Los Angeles, Calif.

**A REVIEW OF THE SOLAR ARRAY MANUFACTURING  
INDUSTRY COSTING STANDARDS**

Jul 1977. 134 p. Sponsored in part by ERDA. Prepared for JPL. (Contract NAS7-100, JPL-954800). (NASA-CR-153401, ERDA/JPL-954800-77/1). Avail NTIS HC A07/MF A01 CSCL 10A.

The solar array manufacturing industry costing standards model is designed to compare the cost of producing solar arrays using alternative manufacturing processes. Constructive criticism of the methodology used is intended to enhance its implementation as a practical design tool. Three main elements of the procedure include workbook format and presentation, theoretical model validity, and standard financial parameters. Author

**N77-30609\*#** Bechtel Corp., San Francisco, Calif.  
**ENGINEERING STUDY OF THE MODULE/ARRAY IN-  
TERFACE FOR LARGE TERRESTRIAL PHOTOVOLTAIC  
ARRAYS** Final Report

Jun 1977. 165 p. refs. Sponsored in part by ERDA. Prepared for JPL. (Contracts NAS7-100, JPL-954698). (ERDA/JPL-954698-77/1). Avail NTIS HC A08/MF A01 CSCL 10A.

Three major areas--structural, electrical, and maintenance--were evaluated. Efforts in the structural area included establishing acceptance criteria for materials and members, determining loading criteria, and analyzing glass modules in various framing system configurations. Array support structure design was addressed briefly. Electrical considerations included evaluation of module characteristics, intermodule connectors, array wiring, converters, and lightning protection. Plant maintenance features such as array cleaning, failure detection, and module installation and replacement were addressed. Author

**N77-30610\*#** Energy Research Corp., Danbury, Conn  
**FABRICATION AND TESTING OF LARGE SIZE NICKEL-ZINC CELLS**

Martin Klein Apr 1977 62 p refs  
 (Contract NAS3-19415)  
 (NASA-CR-135200) Avail NTIS HC A04/MF A01 CSCL 10C

The design and construction of nickel zinc cells, containing sintered nickel electrodes and asbestos coated inorganic separator materials were outlined. Negative electrodes were prepared by a dry pressing process while various inter-separators were utilized on the positive electrodes consisting of non-woven nylon non-woven polypropylene, and asbestos. Author

**N77-30611\*#** National Aeronautics and Space Administration  
 Lewis Research Center Cleveland Ohio  
**DRIVE TRAIN NORMAL MODES ANALYSIS FOR THE ERDA/NASA 100-KILOWATT WIND TURBINE GENERATOR**

T L Sullivan, D R Miller and D A Spera Jul 1977 34 p refs  
 (Contract E(49-26)-1028)  
 (NASA-TM-73718 E-9266, ERDA/NASA-1028-77/1) Avail NTIS HC A03/MF A01 CSCL 10B

Natural frequencies as a function of power were determined using a finite element model. Operating conditions investigated were operation with a resistive electrical load and operation synchronized to an electrical utility grid. The influence of certain drive train components on frequencies and mode shapes is shown. An approximate method for obtaining drive train natural frequencies is presented. Author

**N77-30613\*#** National Aeronautics and Space Administration  
 Marshall Space Flight Center Huntsville Ala  
**HORIZONTALLY MOUNTED SOLAR COLLECTOR Patent Application**

Dolphus H Black, inventor (to NASA) Filed 9 Aug 1977 18 p  
 (NASA-Case-MFS-23349-1, US-Patent-Appl-SN-823061) Avail NTIS HC A02/MF A01 CSCL 10A

A horizontally mounted solar collector for collecting solar energy utilizing a vertical deflector assembly, a stationary reflector and a collector is described. The deflector assembly contains a plurality of vanes which change the direction of the solar energy to the vertical while constantly keeping the same side of the deflector facing the sun. The vertical rays are then reflected off the stationary reflector and are then absorbed by the collector. NASA

**N77-30617\*#** National Aeronautics and Space Administration  
 Marshall Space Flight Center Huntsville Ala  
**AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF A 1.8 BY 3.7 METER FRESNEL LENS SOLAR CONCENTRATOR**

Leon J Hastings, Steve L Allums, and Warren S Jensen Aug 1977 77 p refs  
 (NASA-TP-1005, M-224) Avail NTIS HC A05/MF A01 CSCL 10A

Line-focusing acrylic Fresnel lenses with application potential in the 200 to 370 C range are being analytically and experimentally evaluated. Investigations previously conducted with a 56 cm wide lens have been extended by the present study to experimentation/analyses with a 1.8 by 3.7 m lens. A measured peak concentration ratio of 64 with 90 percent of the transmitted energy focused into a 5.0 cm width was achieved. A peak concentration of 61 and a 90 percent target width of 4.5 cm were analytically computed. The experimental and analytical lens transmittance was 81 percent and 86 percent, respectively. The lens also was interfaced with a receiver assembly and operated in the collection mode. The collection efficiency ranged from 42 percent at 100 C to 26 percent at 300 C. Author

**N77-30620#** Mitre Corp., Bedford, Mass  
**WIND MACHINES**

Frank R Eldridge Oct 1975 81 p refs  
 (Grant NSF AER-75-12937)  
 (NSF/RA/N-75-051) Avail NTIS MF A02 SOD HC \$2.25

Present status of the viability, history, taxonomy, and future potential of various types and sizes of wind machines that might be used to help meet future U.S. energy demands was outlined. Various possible applications of wind machines, as well as siting problems, also performance characteristics and system designs for such machines were also discussed. Author

**N77-30621#** Defense Documentation Center, Alexandria, Va  
**SOLAR CELLS AND SOLAR PANELS Report Bibliography, Oct 1958 - Sep 1976**

Apr 1977 268 p refs Supersedes DDC-TAS-73-51  
 (AD-A039100, DDC/BIB-76/04, DDC-TAS-73-51) Avail NTIS HC A12/MF A01 CSCL 10/2

This bibliography is a selection of unclassified and unlimited distribution references on Solar Cells and Solar Panels. These citations of reports present information on performance characteristics, fabrication, development of power levels, degradation studies of solar cells, and systems for orienting solar panels continuously toward the sun. Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided. Author (GRA)

**N77-30623#** Tetra Tech, Inc., Arlington, Va  
**US NAVY ENERGY R AND D Progress Report, Oct. 1976 - Mar 1977**

Apr 1977 141 p refs  
 (Contract N00014-76-C-0239)  
 (AD-A039546, TT-A-872-77-316) Avail NTIS HC A07/MF A01 CSCL 10/1

This U.S. Navy Energy R and D Progress report summarizes the progress and accomplishments of the Navy Energy R and D Program for the period from October 1976 through March 1977. This report complements the U.S. Navy Energy R and D Program Plan, FY 1977-FY 1982 published in October 1976. Author (GRA)

**N77-30626#** UOP, Inc., Des Plaines, Ill  
**OPTIMIZATION OF PLATINUM-DOPED KOCITE ELECTRODES IN H3PO4 FUEL CELLS Interim Progress Report, Sep - Dec 1976**

L B Welsh and R W Leyerle Mar 1977 88 p refs  
 (Contract DAAG53-76-C-0014, DA Proj 1G7-62708-AH-78)  
 (AD-A039242 IPR-3) Avail NTIS HC A05/MF A01 CSCL 09/1

The use of UOP platinum impregnated Kocite materials as low-cost air and/or fuel electrocatalysts in phosphoric acid electrolyte fuel cells has been optimized with respect to some of the electrocatalyst and electrode structure parameters. Kocite materials are composite structures consisting of pyropolymers chemically bonded to refractory substrates. Fuel cell electrodes were fabricated from these materials and tested as anodes or cathodes in model fuel cells with Teflon-bonded platinum-black counter electrodes. GRA

**N77-30628#** Oak Ridge National Lab., Tenn  
**SAVINGS IN ENERGY CONSUMPTION BY RESIDENTIAL HEAT PUMPS. THE EFFECTS OF LOWER INDOOR TEMPERATURES AND OF NIGHT SETBACK**

R D Ellison Jan 1977 32 p refs  
 (Contracts W-7405-eng-26, FEA-CG-04-75-012-0)  
 (ORNL/CQN-4) Avail NTIS HC A03/MF A01

The energy saving potential of reduced indoor temperatures and of night setback is examined for residential heat pumps. A computer program was used to calculate heating loads to modify and to evaluate the heating capacity, energy consumption, and running time of heat pumps on an hourly basis as a function of outdoor dry bulb temperature and to simulate the use and energy consumption of auxiliary resistance heaters. Annual heating loads,

## N77-30629

energy consumption percentage savings and seasonal COP's. Coefficients of performance are presented for several indoor temperature regimes and a variety of climatic conditions. Hourly profiles of these quantities give some insight into the energy savings found. ERA

### N77-30629# Data Resources, Inc. Lexington, Mass **RESIDENTIAL DEMAND FOR ENERGY, VOLUME 1 Final Report**

Lester D. Taylor (Arizona Univ., Tempe) Gail R. Blattenberger, and Philip K. Verleger Jr. Jan 1977 148 p refs  
(EPRI Proj 431-1)  
(EPRI-EA-235-Vol-1) Avail NTIS HC A07/MF A01

Residential demand for energy over the period 1956 to 1972 with principal emphasis on the residential demand for electricity is examined. Decreasing block pricing in the sale of electricity in a manner that is appropriate theoretically and sound econometrically was studied. A price data set was constructed derived from actual residential rate schedules. ERA

### N77-30631# Army Cold Regions Research and Engineering Lab Hanover N H

#### **DEMONSTRATION OF BUILDING HEATING WITH A HEAT PUMP USING THERMAL EFFLUENT Special Report**

Peter W. Sector May 1977 30 p refs  
(AD-A041024, CRREL-SR-77-11) Avail NTIS  
HC A03/MF A01 CSCL 13/1

This report describes efforts made to recover waste heat and to reuse it to heat a building. A heat pump, which is a refrigeration device, was operated to provide building heat and to demonstrate both economic benefits and energy savings possible with this type of heating system. Heat pump fundamentals and system design considerations supplement the report of this demonstration project. Operational characteristics were monitored and are reported. A 25% reduction in heating costs was observed compared with an oil-fired system. The author recommends that the minimum coefficient of performance should be 3.4 for a cost effective energy-conservative heat pump heating system. Author (GRA)

### N77-30632# Colorado Springs Dept of Public Utilities, Colo **ASSESSMENT OF A SINGLE-FAMILY RESIDENCE SOLAR HEATING SYSTEM IN A SUBURBAN DEVELOPMENT SETTING PROJECT PHOENIX Final Report, 1 Jul 1974 - 1 Jul 1976**

J. D. Phillips Jul 1976 180 p refs  
(Grant NSF GI-44210)  
(PB-263192/7, NSF/RA-760192) Avail NTIS  
HC A09/MF A01 CSCL 13A

The Phoenix Project is an in-depth investigation into a fluid-to-air solar optimized heat pump. The approach used was to construct a house heated by a solar optimized heat pump. The house and heating system were tested under actual operating conditions for a period of two years. The major conclusion is that a solar optimized heat pump system for residential application is now a viable alternative to conventional fuel sources. GRA

### N77-30633# Federal Energy Administration, Washington, D C Office of the Administrator **ENERGY SITUATION**

Jul 1976 23 p  
(PB-266836/6, FEA/T-77/177) Avail NTIS  
HC A02/MF A01 CSCL 21D

Energy consumption rate in the United States is evaluated. Even with sharp increases in energy prices following the Arab embargo, the use of energy per dollar GNP has remained relatively stable. Domestic oil production, which has been declining since 1970, will continue to do so but at a rate less than that experienced prior to the 1973-1974 embargo. Production will stabilize and then increase in the next few years as approximately 1.6 million barrels per day of Alaskan oil is transported to the lower 48 states. GRA

### N77-30635# California Polytechnic State Univ., San Luis Obispo **RESEARCH ON THE APPLICATION OF SOLAR ENERGY TO THE FOOD DRYING INDUSTRY Final Report**

Thomas Lukes 31 Dec 1975 118 p refs  
(Grant NSF ERT-74-19063)  
(PB-267210/3, NSF/RANN/SE/ERT-74-19063/FR-75  
NSF/RA/N-75-294) Avail NTIS HC A06/MF A01 CSCL  
10A

Several solar collector configurations were investigated as to their suitability for drying food crops. Various fruits and vegetables were dried using a mixture of solar energy and steam heat or solar energy alone. Cost estimates (based on initial construction material costs only) indicate that when the price of oil delivered to this country reaches \$17 per barrel, then solar energy becomes competitive. GRA

### N77-30636# Federal Energy Administration, Washington, D C Office of Regulatory Programs

#### **CONTINUATION OF THE ADJUSTMENT AS A PRODUCTION INCENTIVE TO THE MAXIMUM WEIGHTED AVERAGE FIRST SALE PRICE FOR DOMESTIC CRUDE OIL (ENERGY ACTION NO. 11)**

15 Mar 1977 150 p refs  
(PB-266841/6, FEA/H-77/176) Avail NTIS  
HC A07/MF A01 CSCL 21D

Energy consideration measures dealing with amendment to the regulations historical summary of the implementation of section 8 of the Emergency Petroleum Allocation Act of 1973 and projects prices for domestic crude oil with and without the adjustment as a production incentive are presented. GRA

### N77-30637# California Univ. Davis Inst of Ecology **LAND USE, ENERGY FLOW AND POLICY MAKING IN SOCIETY SIMPAC HANDBOOK A GUIDE TO THE MODELING OF SOCIO-ECONOMIC PHENOMENA**

Peter J. Hunter, Nancy J. Mosman, and John L. Mitchiner 1975  
291 p  
(Grant NSF GI-27)  
(PB-267134/5, NSF/RA/E-75-057) Avail NTIS  
HC A12/MF A01 CSCL 10A

This handbook can be applied to a variety of socio-economic models. It provides a documented package of computer programs that are used to implement the methodology and describes in detail the mechanics of transforming a conceptual model like SPECULATOR in computer code. GRA

### N77-30645# California Univ. Livermore Lawrence Livermore Lab

#### **ENVIRONMENTAL EFFECTS OF ENERGY PRODUCTION AND UTILIZATION IN THE US VOLUME 1 SOURCES, TRENDS AND COSTS OF CONTROL**

Herbert W. Newkirk, comp 1 May 1976 481 p refs  
(Contract W-7405-eng-48)  
(UCRL-51930-Vol-1) Avail NTIS HC A21/MF A01

Sources of pollution (what the emissions are and where they come from), trends (quantities of emissions and their dispersion with time) and costs of control (what it takes in time, energy, and money to meet minimum standards) are considered. Sections dealing with the atmosphere, water, land, and social activities are included. ERA

### N77-30657# Bureau of Mines, Spokane Wash Spokane Mining Research Center

#### **PHYSICAL PROPERTIES OF WESTERN COAL WASTE MATERIALS**

R. R. Backer, R. A. Busch, and L. A. Atkins 1977 36 p refs  
(PB-266724/4, BM-RI-8216) Avail NTIS HC A03/MF A01  
CSCL 08I

The relatively cleaner product from the predominance of surface mining and occurrence of thicker seams in the West reduces the amount of coal preparation required and the size of the waste piles. Because of the abundance of land available for waste disposal, many of the piles are low and extended over large areas. New concepts relating statistical shear strength data to liquefaction potential are presented. GRA

**N77-30680\*** Kanner (Leo) Associates Redwood City, Calif  
**THE RELATION BETWEEN ISOTOPIC COMPOSITION OF ARGON AND CARBON IN NATURAL GASES**

Y Y Gavrilov, Yu A Zhurov, and G I Tepinskiy Washington  
 NASA Jul 1977 10 p refs Transl into ENGLISH from  
 Dokl Akad Nauk SSSR, Geokhimiya (USSR), v 206, no 2,  
 1972 p 448-451

(Contract NASw-2790)

(NASA-TM-75134) Avail NTIS HC A02/MF A01 CSCL 08G

The methods and results of determination of the argon and carbon isotope compositions of hydrocarbon gases of Mesozoic complexes of Western Siberia are presented Based on the Ar-36, Ar-40, C-12, C-13 content of the various deposits and on the presumed mechanisms of entry of these isotopes into the deposits, it is concluded that formation of natural gas in some deposits included vertical migration from a lower complex Author

**N77-30841\*** Rosenstiel School of Marine and Atmospheric Sciences Miami Fla

**CLASSIFICATION OF OILS BY THE APPLICATION OF PATTERN RECOGNITION TECHNIQUES TO INFRARED SPECTRA Final Report**

James S Mattson Mar 1976 49 p refs

(Contract DOT-CG-81-75-1364)

(AD-A039387 USCG-D-6-77) Avail NTIS HC A03/MF A01 CSCL 11/8

The classification of multicomponent petroleum oils (crude oils lubricants distillate and residual fuels) solely by their infrared absorption spectra is a difficult task Crude oils alone include a phenomenal variety of systems, from heavy asphaltic crudes to light crudes that are similar to a No 2 fuel oil Furthermore the distinctions between classes of fuel oils (i.e Nos 1 2 4 5 and 6 fuels) are based upon ASTM specifications for continuous properties such as flash point and viscosity In South Florida for example local fuel oil suppliers meet requests for Nos 4 or 5 fuel oils by blending together appropriate proportions of Nos 2 and 6 fuels In order to reduce the amount of sampling required in the event of an oil pollution incident it would be useful to be able to initially classify the pollution sample into one of the above groups Infrared spectroscopy has been promoted as a useful analytical technique for oil classification and identifications, since it does provide some information on the aliphatic aromatic polynuclear aromatic carbonyl and organosulfur composition of an oil Infrared spectra have been used in previous efforts to distinguish asphalts from residual fuels and to provide a tool for 'fingerprinting' oils Kawahara et al applied linear discriminant function analysis (LDFA) to their infrared data to make the binary distinction between asphalts and residual fuels Author (GRA)

**N77-31019\*** National Bureau of Standards, Washington, D C  
**DIMENSIONS. VOLUME 61, NUMBER 3 Monthly Report**

Mar 1977 37 p refs

(PB-266997/6, NBS-DIM-61-3)

Avail NTIS

HC A03/MF A01 CSCL 05B

Short summations of major technical developments, highlights of work in progress, major speeches and statements by Bureau management, and a listing of NBS publications are presented Topics discussed include (1) incentives for solar heating systems, (2) smoke detectors, (3) mechanisms for removal of hydrocarbons from lower atmosphere, (4) electrically tuned far infrared lasers, and (5) air pollution standard reference materials Author

**N77-31024\*** Massachusetts Inst of Tech, Cambridge Operations Research Center

**OPTIMIZATION MODELS FOR PLANNING ECONOMIC DEVELOPMENT**

Silvia Pariente Apr 1977 64 p refs

(Contract N00014-75-C-0556 NR Proj 347-027, MIT Proj

OSP-82491)

(AD-A039165 TR-130) Avail NTIS HC A04/MF A01 CSCL 05/3

In recent years, more and more countries have experimented with quantitative methods as a way to design short term and long term plans, and to evaluate the impacts of investment and other policies on the future development of their economies Optimization models have proved useful in several fields of economics, such as economic growth and development planning, urban and regional economics, agricultural and energy economics, etc The purpose of this paper is to formulate optimization models that can be applied fruitfully for economy-wide planning sectoral planning and project evaluation It is an attempt at synthesizing the different models encountered in the literature and at describing some of the difficulties inherent to this approach Author (GRA)

**N77-31040\*** Chemtrix Inc Rosemont, Ill  
**DEVELOPING AND TESTING OF A WASTEWATER RECYCLER AND HEATER**

Victor J Guarino and Robert A Bambanek Dec 1976 106 p  
 Sponsored in part by NASA Army Med Res and Develop Comm HUD, and Coast Guard

(Contract EPA-68-03-0436)

(NASA-CR-154846, PB-266961/2, EPA-600/2-76-289) Avail  
 NTIS HC A06/MF A01 CSCL 13B

The feasibility of an automatic and self-contained appliance that can recover and store usable hot water from waste laundry water, using essentially the same amount of energy as an equivalent-capacity water heater was demonstrated It was shown by extended evaluation tests with a waste stream of real laundry water that this unit is capable of recovering sterile hot water at a steady state rate of 22.7 liters/hour with a specific energy draw of 79 watt-hours/liters without the use of any expendable chemicals Author (GRA)

**N77-31046\*** Bureau of Mines, College Park, Md Metallurgy Research Center

**AN ECONOMIC EVALUATION OF A PROCESS TO SEPARATE RAW URBAN REFUSE INTO ITS METAL, MINERAL, AND ENERGY COMPONENTS**

Thomas A Phillips 1977 32 p refs

(PB-267629/4, BM-IC-8732) Avail NTIS HC A03/MF A01 CSCL 13B

An economic assessment of the Bureau of Mines process for the separation and recovery of ferrous metal mixed nonferrous metals, aluminum, mixed-color glass cullet, and refuse derived fuel products from raw refuse was made for a plant capable of processing 1,000 tons per day of raw urban refuse operating 2 shifts, 6 days per week The fixed capital cost, based on second quarter 1976 equipment costs is \$14,529,600 excluding land and shipping facilities Credit for the products is not included in the estimated operating cost of \$7.96 per ton of refuse processed, nor are taxes or fees for tipping, dumping, transportation or financing GRA

**N77-31141\*** Boeing Aerospace Co, Seattle, Wash Military Airplane Development

**INNOVATIVE AIRCRAFT DESIGN STUDY (IADS) TASK 2, VOLUME 1 Final Report**

E A Barber, D G Blattner, R C Sutton, and M J Mailhot Jun 1977 186 p refs

(Contract F33615-76-C-0122)

(AD-A041234) Avail NTIS HC A09/MF A01 CSCL 01/3

The study was concerned with the conceptual design and evaluation of military heavy logistics transport aircraft entering service in the 1990-2000 time period Design payloads of 200,000-800,000 lb and design ranges of 3600-7200 nm were considered Takeoff field length was 8,000 ft in most cases Suitability for commercial usage was a major objective Computer aided design techniques were employed extensively for airplane synthesis and analysis The study was accomplished in two phases Phase I included parametric design and analysis of transports in the payload/range categories cited above An advanced technology review, including evaluations and sensitivity analyses, was accomplished These studies indicated that substantial gains were possible in reducing operating costs by incorporating both the



## N77-31207

low risk technology and innovative designs available in 1985, and advanced technology such as composite structures available at a later time. Additional effort is required to identify this increased cost of higher risk advanced technology to determine its cost effectiveness. In Phase II, a baseline mission requiring 3600 nm radius and 400,000 lb payload was selected. GRA

**N77-31207\*** Jet Propulsion Lab, Calif Inst of Tech, Pasadena DSN Engineering Section

### **COMPARATIVE THERMODYNAMIC PERFORMANCE OF SOME RANKINE/BRAYTON CYCLE CONFIGURATIONS FOR A LOW-TEMPERATURE ENERGY APPLICATION**

F L Lansing *In its* The Deep Space Network 15 Aug 1977 p 156-167

Avail NTIS HC A10/MF A01 CSDL 10A

Various configurations combining solar-Rankine and fuel-Brayton cycles were analyzed in order to find the arrangement which has the highest thermal efficiency and the smallest fuel share. A numerical example is given to evaluate both the thermodynamic performance and the economic feasibility of each configuration. The solar-assisted regenerative Rankine cycle was found to be leading the candidates from both points of energy utilization and fuel conservation. Author

**N77-31225\*** PRC Systems Sciences Co., Los Angeles, Calif

### **SURVEY OF SATELLITE POWER STATIONS**

Charles E Bloomquist Sep 1976 342 p refs (Contract EX-76-C-01-2071)

(DSE/2071-1) Avail NTIS HC A15/MF A01

The appropriate role of satellite power station research and development in ERDA's overall program is reviewed. A task group requested the support to consist of (1) consolidating the relevant documentation, (2) providing summary descriptions of the major systems and subsystems, (3) delineating the status of key technologies, (4) preparing brief summaries of the key economic and environmental issues, and (5) assisting the task group in preparation of specified documentation. Supporting efforts are also investigated. Author

**N77-31269\*** California Univ., Berkeley Lawrence Berkeley Lab

### **CHROMATOGRAPHIC DETERMINATION OF ADSORPTION AND DIFFUSION IN A BIDISPERSED POROUS SOLID**

P G Boisvert and E E Petersen Sep 1976 116 p refs

(Contract W-7405-eng-48)

(LBL-5273) Avail NTIS HC A06/MF A01

Mass transfer within a well defined bidispersed solid structurally similar to coal, namely 5A molecular sieves, was studied. The diffusion and adsorption of nitrogen, argon, and carbon dioxide were studied using a chromatographic technique. A monodispersed pore model was used to describe the bidispersed pore system of the 5A molecular sieve. This model was an accurate representation of the 5A pore system since negligible mass transfer resistance was measured in the micropores. Much larger solid-adsorbate interactions occur with carbon dioxide than with argon or nitrogen possibly due to the higher polarizability and linear molecular geometry of carbon dioxide. Extrapolation of these results to coal suggests that highly polar solvents may exhibit better penetrability into coal due to the higher surface interactions. This should yield more efficient coal liquefaction processes by increasing the amount of internal surface area contacted by the solvent. ERA

**N77-31271\*** Oak Ridge National Lab., Tenn Analytical Chemistry Div

### **APPROACHES TO CHEMICAL CLASS ANALYSES OF FOSSIL DERIVED MATERIALS**

Bruce R Clark, C-h Ho, and A Russell Jones 1977 19 p refs Presented at 173d Natl Meeting of the Am Chem Soc., New Orleans, 20-25 Mar 1977 Sponsored in part by EPA (Contract W-7405-eng-26)

(CONF-770301-5) Avail NTIS HC A02/MF A01

Techniques used to isolate two specific classes of compounds are outlined as well as a general class separation method for coal liquids, shale oils, or crude petroleum. The specific methods aim for the isolation of an alkane or a polycyclic aromatic hydrocarbon enriched fraction. ERA

**N77-31308\*** National Aeronautics and Space Administration Pasadena Office, Calif

### **OIL AND FAT ABSORBING POLYMERS Patent**

Harold E Marsh, Jr., inventor (to NASA) (JPL) Issued 2 Aug 1977 6 p Filed 7 Apr 1976 Supersedes N76-26345 (14-17, p 2174) Continuation-in-part of abandoned US Patent Appl SN-228229, filed 22 Feb 1972 Sponsored by NASA (NASA-Case-NPO-11609-2, US-Patent-4,039-489, US-Patent-Appl-SN-674700, US-Patent-Class-260-2 5A, US-Patent-Class-210-40, US-Patent-Class-210-DIG 27, US-Patent-Class-260-2 5AM, US-Patent-Class-260-2 5AY, US-Patent-Class-260-77 5AP, US-Patent-Appl-SN-228229) Avail US Patent Office CSDL 07C

A method is described for forming a solid network polymer having a minimal amount of crosslinking for use in absorbing fats and oils. The polymer remains solid at a swelling ratio in oil or fat of at least ten and provides an oil absorption greater than 900 weight percent.

Official Gazette of the U S Patent Office

**N77-31323\*** Argonne National Lab., Ill Material Science Div

### **CERAMIC COATINGS FOR COMPONENTS EXPOSED TO COAL-GAS ENVIRONMENTS A REVIEW**

R Swaroop Dec 1976 34 p refs

(Contract W-31-109-eng-38)

(ANL-76-124) Avail NTIS HC A03/MF A01

The corrosive and erosive environments at high temperatures and pressures in coal gasifiers impose severe requirements on the alloys of fabrication. A concise review of the application of ceramic coatings to resist coal-gas environments was conducted. This review attempts to explore suitable ceramic or cermet materials that may resist or retard the degradation of metal components and to summarize the state of the art of various methods of producing such coatings. ERA

**N77-31334\*** RAND Corp., Santa Monica, Calif

### **AN EVALUATION OF VERY LARGE AIRPLANES AND ALTERNATIVE FUELS Interim Report**

W T Mikolowsky, L W Noggle, W F Hederman, and R E Horvath Dec 1976 401 p refs

(Contract F49620-77-C-0023)

(AD-A040532, R-1889-AF) Avail NTIS HC A18/MF A01 CSDL 01/3

Very large airplanes using alternative fuels are examined in the context of existing and possible future Air Force missions. Synthetic jet fuel (JP), liquid methane, liquid hydrogen, and nuclear propulsion are the fuel alternatives selected for detailed analysis. Conceptual designs of airplanes using each of these fuels were developed and estimates were made of their life-cycle cost and life-cycle energy consumption. Mission analyses were performed to determine the effectiveness of the alternative airplanes in strategic airlift specifically and in the station-keeping role in general. Results indicate that for most military applications airplanes with gross weights in excess of one million pounds promise to be superior to any contemporary airplanes in terms of cost-effectiveness and energy-hydrocarbon jet fuel, whether manufactured from oil shale, coal or crude oil, remains the most attractive aviation fuel for future Air Force use. Policy recommendations are made pertaining both to alternative fuels and to advanced-technology large airplanes. Future research and developments are also identified. Author (GRA)

**N77-31336\*** Kentucky Univ., Lexington

### **TECHNOECONOMIC ANALYSIS OF LARGE SCALE THERMONUCLEAR PRODUCTION OF HYDROGEN Final Report**

James E Funk Dec 1976 180 p refs Prepared in cooperation with CE-Lummus, Bloomfield, N.J (EPRI Proj 467)

(EPRI-EM-287) Avail NTIS HC A09/MF A01

Capital and operating costs and overall process efficiency are presented for a four-reaction thermochemical process which produces hydrogen from water. These results were obtained from a detailed preliminary plant design which was made after the selection of a suitable process and the establishment of a design basis. Selection of an appropriate process involved the evaluation of estimated process efficiency, materials problems, and availability of data for known thermochemical cycles. This initial screening resulted in the identification of four cycles which appeared promising in terms of low cost and efficient hydrogen production. A more detailed analysis of these four cycles included the preparation of mass and energy balances including the interface with the nuclear heat source and the specification of separation techniques, operating conditions, etc. Process thermal efficiency was re-estimated and the problems involved in the design of a large-scale plant were evaluated in more detail. ERA

**N77-31337#** Westinghouse Electric Corp., Pittsburgh, Pa Advanced Energy Systems Div  
**HYDROGEN GENERATION PROCESS Quarterly Technical Progress Report, 17 May - 16 Aug. 1976**

G H Farberman and L E Brecher Sep 1976 63 p refs (Contract EX-76-C-01-2262)

(FE-2262-3) Avail NTIS HC A04/MF A01

The technical and economic feasibility of a hybrid electrolytic-thermochemical hydrogen generation process based upon the electrolysis of sulfuric acid is examined. The operating characteristics of key process steps in the hydrogen generating cycle are determined and engineering and economic analyses performed to evaluate the system are described. Emphasis is placed on finding alternate sources of energy as well as methods to prolong the lifetime of remaining fossil fuels. J M S

**N77-31339#** Exxon Research and Engineering Co., Linden, N.J Government Research Lab

**DEVELOPMENT OF HIGH STABILITY FUEL EXECUTIVE SUMMARY Technical Report, 15 Dec. 1969 - 30 Nov 1976**

William F Taylor and John W Frankenfeld Feb 1977 12 p refs

(Contract N00140-74-C-0618)

(AD-A039977, EXXON/GRU 18GAHF 77) Avail NTIS HC A02/MF A01 CSCL 21/4

This report contains an Executive Summary of the work done on the Development of High Stability Fuel program which was carried out by the Government Research Laboratories of Exxon Research and Engineering Company for the Department of the Navy. The overall program consisted of an initial analytical study entitled, 'Investigation and Analysis of Advanced Hydrocarbon Fluids' followed by an extended experimental effort entitled 'Development of High Stability Fuel.' The Executive Summary discusses the following areas: (1) General Background, (2) Program Background, (3) Program objective and Approach, (4) Major Features of the Technology Which Was Developed, (5) Present Significance of This Technology, (6) Significance of This Technology for High Speed Aircraft, and (7) Significance in Relation to Future Synthetic Fuels. Author (GRA)

**N77-31428#** Los Alamos Scientific Lab., N Mex  
**METHODOLOGY FOR THE ANALYSIS OF THE IMPACTS OF ELECTRIC POWER PRODUCTION IN THE WEST**

A Ford and H W Lorber Jan 1977 27 p refs

(Contract W-7405-eng-36)

(LA-6720-PR) Avail NTIS HC A03/MF A01

The project objective is to design a computer-based tool to help decision makers analyze some of the crucial environmental, social, and economic impacts-particularly the following impacts which involve conditions that are unique to the West: the boom town impacts that result from the construction and operation of power plants near small, isolated towns in the sparsely populated

West, and the reduction in visibility caused by the fossil-fuel emissions from power plants, operating in the pristine West. Additional impacts that were addressed include public health effects from fossil-fuel pollutants, occupational health and safety, and the risk of accidental release of radioactive pollutants from nuclear power plants. The scale along which most of these varied impacts are compared is dollars. As an example, the report used to calculate impacts associated with the 1985 expansion plan of the electric utilities belonging to the Western Systems Coordinating Council. ERA

**N77-31444#** Universal Energy Systems, Inc., Dayton, Ohio  
**FLUID DYNAMIC ENERGY CONVERSION AND TRANSFER PROCESSES Final Report, 18 Mar 1973 - 30 Jun 1976**

Ernest F Fretter, Krishan K Joshi, and Russell W Griffith Wright-Patterson AFB, Ohio AFFDL Oct 1976 241 p refs (Contract F33615-73-C-4053, AF Proj 1929)

(AD-A040589, AFFDL-TR-76-96)

Avail NTIS

HC A11/MF A01 CSCL 20/4

This is the final report of research performed on Contract F33615-73-C-4053. The research which included three different work areas, Electrofluid Dynamics (EFD), Multi Component Flows (MCF), and Thrust Augmentation (TA). This report presents the experimental rigs designed and built, experiments performed, and the results of this project's experiments during the contract period. GRA

**N77-31495#** Polytechnic Inst of New York, Brooklyn Dept of Electrical Engineering and Electrophysics

**HEAT-PIPE BISMUTH LASER: EXAMINATION OF LASER ACTION AT 4722 Å IN BISMUTH VAPOR Final Report, 1 May 1973 - 31 Jan 1976**

William T Walter and Nicholas Solimene Nov 1976 69 p refs

(Contract N00014-67-A-0438-0015)

(AD-A039568, POLY-EE/EP-76-022)

Avail NTIS

HC A04/MF A01 CSCL 20/5

The possibility of producing efficient pulsed laser action at 4722 Å in the neutral atomic vapor of bismuth has been examined. The presence of a substantial fraction of dimers ( $\text{Bi}_2$  molecules) in the vapor of bismuth could prevent laser action by absorption of the 3067 Å Bi resonance line. This would not only reduce radiation trapping but would also produce dissociation of the dimers leaving one Bi atom in a metastable proposed lower laser level. Heat pipes were used to create a two temperature zone apparatus and thermally dissociate bismuth dimers. Double-pulses were used to produce discharge dissociation of bismuth dimers. The pressure and composition of bismuth vapor has been critically evaluated. A radial discharge was used to reduce the risetime of the excitation current pulse to approximately 25 nsec which is much shorter than the reciprocal of 5,300,000 sec, the best value for the 4722 Å transition probability. Absence of laser action at 4722 Å is believed due to competing processes within the bismuth atom. GRA

**N77-31589#** Bureau of Mines, Denver, Colo Mining Research Center

**GDIST A COMPUTER CODE FOR ANALYSIS OF STATISTICAL DISTRIBUTIONS OF PHYSICAL DATA**

J R Alldredge and D D Bolstad 1977 63 p refs

(PB-266762/4 BM-IC-8731) Avail NTIS HC A04/MF A01 CSCL 08G

A computer code has been developed for describing and testing the statistical distribution of general continuous data sets. The statistical distributions used include the normal, lognormal, exponential, chi square, gamma, and uniform. Histograms for observed and expected values are plotted for each distribution. An example using geologic data obtained from a study of the geometric properties of natural fractures in oil shale rock illustrates the use of the computer program, GDIST. GRA

**N77-31595#** National Materials Advisory Board, Washington, D C

**A SCREENING FOR POTENTIALLY CRITICAL MATERIALS FOR THE NATIONAL STOCKPILE**

1977 67 p refs Sponsored in part by Bureau of Mines and Dept of Commerce  
(Contract GS-00-DS(P)-94008)  
(PB-267214/5, NMAB-329) Avail NTIS HC A04/MF A01  
CSCL 081

Inorganic and organic source materials were reviewed in an attempt to identify potentially indispensable materials. Primary criticality was based upon short-term stockpiling needs other aspects such as the impact of new energy developments, alternate sources, alternate materials or design, and conservation were considered. Surprisingly few additional materials could be identified clearly as being critical on a worldwide basis however, after screening a broad spectrum of source materials, chromium, germanium, iridium, rhenium, vanadium, and zirconium and hafnium were identified for a more detailed examination. Of these commodities, chromium stands out in importance on the basis of criticality. GRA

**N77-31601\*** National Aeronautics and Space Administration  
Lewis Research Center, Cleveland, Ohio

**SOLAR CELL SHINGLE Patent**

Americo F Forestieri, Anthony F Ratajczak, and Leroy G Sidorak, inventors (to NASA) Issued 9 Aug 1977 5 p Filed 24 Aug 1976 Supersedes N77-10645 (15 - 01, p 0091)  
(NASA-Case-LEW-12587-1, US-Patent-4,040 867,  
US-Patent-Appl-SN-717319, US-Patent-Class-136-89P,  
US-Patent-Class-52-173 RUS-Patent-Class-52-518,  
US-Patent-Class-136-89-AC) Avail US Patent Office CSCL  
10A

A solar cell shingle was made of an array of solar cells on a lower portion of a substantially rectangular shingle substrate made of fiberglass cloth or the like. The solar cells may be encapsulated in fluorinated ethylene propylene or some other weatherproof translucent or transparent encapsulant to form a combined electrical module and a roof shingle. The interconnected solar cells were connected to connectors at the edge of the substrate through a connection to a common electrical bus or busses. An overlap area was arranged to receive the overlap of a cooperating similar shingle so that the cell portion of the cooperating shingle may overlie the overlap area of the roof shingle. Accordingly, the same shingle serves the double function of an ordinary roof shingle which may be applied in the usual way and an array of cooperating solar cells from which electrical energy may be collected.

Official Gazette of the U S Patent Office

**N77-31603#** Joint Economic Committee (U S Congress)

**THE ECONOMICS OF SOLAR HOME HEATING**

William D Schulze (New Mexico Univ) Washington GPO 1977 90 p refs Study for Joint Economic Comm, 95th Congr, 1st Sess, 13 Mar 1977  
(GPO-85-329) Avail SOD HC \$1 35

The feasibility of residential use of solar energy is presented. Its extensive application as a result of energy price decontrols or in areas of natural gas shortages is discussed. The economic incentive for solar energy conversion through low interest loans is outlined. G D H

**N77-31604#** Grumman Aerospace Corp, Bethpage, NY  
Material and Structural Mechanics

**A NON-AEROSPACE APPLICATION OF PLANS: PRE-LIMINARY STRUCTURAL DESIGN OF WIND TURBINE DIFFUSER**

J Crouzet-Pascal Mar 1977 88 p refs  
(Contract E(11)-2616)  
(RM-629) Avail NTIS HC A05/MF A01

A baseline design for a lightweight diffuser, its calculated weight, and the method employed to calculate the specific sizes in the design are described. Formulas are presented that permit the straightforward assessment of the effect on the diffuser weight, and the related cost of power generation, of changes in dimensions, material, or allowable deflections. It was established that for a scale variation in the over-all size of the diffuser, the cost of

power generation attributable to the diffuser varies linearly with the diffuser front radius. It was also established that as compared to using aluminum, the cost would actually go up with standard strength steel but down with higher strength steel. Allowing the structure to be more flexible cannot yield a reduction in cost unless a change in material properties is allowed. Author

**N77-31605\*#** National Aeronautics and Space Administration  
Ames Research Center, Moffett Field Calif

**SOME STUDIES ON A SOLID STATE SULFUR PROBE FOR COAL GASIFICATION SYSTEMS**

K T Jacob (California Univ, Berkeley), D Bhogeswara Rao, and Howard G Nelson Aug 1977 22 p refs  
(NASA-TM-78428, A-7162) Avail NTIS HC A02/MF A01  
CSCL 21D

Measurements on the solid electrolyte cell ( $\text{Ar} + \text{H}(2) + \text{H}(2)\text{S}/\text{CaS} + \text{CaF}(2) + (\text{Pt})//\text{CaF}(2)//(\text{Pt}) + \text{CaF}(2) + \text{CaS}/\text{H}(2) + \text{H}(2)+\text{Ar}$ ) show that the emf of the cell is directly related to the difference in sulfur potentials established at the  $\text{Ar} + \text{H}(2) + \text{H}(2)\text{S}$ /electrode interfaces. The electrodes convert the sulfur potential gradient across the calcium fluoride electrolyte into an equivalent fluorine potential gradient. Response time of the probe varies from approximately 9 hr at 990 K to 2.5 hr at 1225 K. The conversion of calcium sulfide and/or calcium fluoride into calcium oxide is not a problem anticipated in commercial coal gasification systems. Suggestions are presented for improving the cell for such commercial applications. Author

**N77-31606#** Committee on Interstate and Foreign Commerce  
(U S House)

**FEA FINAL REPORTS ON OIL AND GAS RESOURCES, RESERVES, AND PRODUCTIVE CAPACITIES**

Washington GPO 1977 80 p refs Hearing before Subcomm on Oversight and Investigations of the Comm on Interstate and Foreign Commerce 94th Congr, 2d Sess, 6 Aug 1976  
(GPO-80-748) Avail Subcomm on Oversight and Investigations

The ability of the FEA to produce information unaffected by political considerations and produced independently of industry is examined. Emphasis is placed on estimates of natural gas and oil reserves. J M S

**N77-31607#** Committee on the Budget (U S House)

**ECONOMIC AND BUDGET IMPACT OF THE PRESIDENT'S ENERGY PROPOSALS**

Washington GPO 1977 167 p refs Hearing before Comm on the Budget, 95th Congr, 1st Sess, 29 Jun 1977  
(GPO-93-689) Avail Comm on the Budget

Conservation incentives in the form of tax credits, new taxes on gas guzzling cars, a crude oil equalization tax, taxes in industrial and utility use of natural gas and oil, and changes in natural gas pricing are discussed in terms of the impact on the American economy and the Federal budget. Although testimony is provided on the long-term budget and economic effects, primary focus is placed on the immediate impact for FY 1978. J M S

**N77-31608#** Committee on Interstate and Foreign Commerce  
(U S House)

**COMPILATION OF ENERGY-RELATED LEGISLATION. VOLUME 1: OIL, GAS, AND ELECTRIC POWER**

Washington GPO 1977 291 p refs Rept by Comm on Interstate and Foreign Commerce, 95th Congr, 1st Sess, Mar 1977  
(GPO-80-323, Print-95-2) Avail SOD HC \$2 75

Legislation dealing with oil, gas, and electric power is presented. Emergency Petroleum Allocation Act of 1973, Trans-Alaska Oil Pipeline, Natural Gas Act, Alaska Natural Gas Transportation Act of 1976, Public Utility Holding Company Act of 1935, and the National Environmental Policy Act of 1969 are a few of the pieces of legislation presented. J M S

**N77-31609#** Committee on Interstate and Foreign Commerce  
(U S House)

**COMPILATION OF ENERGY-RELATED LEGISLATION. VOLUME 2 OTHER ENERGY LEGISLATION**

Washington GPO 1977 335 p refs Rept by Comm on Interstate and Foreign Commerce 95th Congr 1st Sess Mar 1977

(GPO-80-324, Print-95-3) Avail SOD HC \$3 05

Legislation emphasizing energy policy and conservation as well as environmental protection is presented without discussion J M S

**N77-31610\*** National Aeronautics and Space Administration Marshall Space Flight Center Huntsville, Ala  
**ALUMINUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY AND THE METHOD OF PRODUCING SAID PANEL Patent Application**

Marion L Roberts, Max H Sharpe, and Albert C Krupnick, inventors (to NASA) Filed 31 Aug 1977 23 p (NASA-Case-MFS-23518-1 US-Patent-Appl-SN-829390) Avail NTIS HC A02/MF A01 CSDL 10A

Panels for selectively absorbing solar energy were developed. An aluminum substrate, a layer of zinc thereon, a layer of nickel over the zinc layer and an outer layer of solar energy absorbing nickel oxide comprise one panel. A copper substrate with a layer of nickel thereon and a layer of solar energy absorbing nickel oxide distal from the copper substrate compose a second panel. A method for making aforesaid panels is disclosed. NASA

**N77-31611\*** National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala  
**STAINLESS STEEL PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY AND THE METHOD OF PRODUCING SAID PANEL Patent Application**

Marion L Roberts, Max H Sharpe, and Albert C Krupnick, inventors (to NASA) Filed 2 Sep 1977 17 p (NASA-Case-MFS-23518-2, US-Patent-Appl-SN-830382) Avail NTIS HC A02/MF A01 CSDL 10A

A panel for selectively absorbing solar energy comprises a stainless steel metal substrate coated by a natural oxide of the metal. The panel is made by heating a cleaned stainless steel substrate in an oxygen-containing gas at 1500 - 1700 F. NASA

**N77-31612\*** National Aeronautics and Space Administration Lewis Research Center Cleveland Ohio

**NASA THERMIONIC-CONVERSION PROGRAM**

James F Morris 1977 9 p refs Presented at the 12th Intersoc Energy Conversion Eng Conf Washington DC 28 Aug - 2 Sep 1977, cosponsored by the IEEE, the Am Inst of Chem Eng, the Am Nucl Soc, the Soc of Automotive Eng, the Am Chem Soc, the AIAA and the ASME (NASA-TM-X-73644, E-9150) Avail NTIS HC A02/MF A01 CSDL 10A

Technological processes in out-of-core thermionic energy conversion are described. The emphasis was on high temperature electrode materials and system engineering of converter geometries to produce practical power densities. I M

**N77-31614\*** National Aeronautics and Space Administration Lewis Research Center Cleveland, Ohio

**INVESTIGATION OF EXCITATION CONTROL FOR WIND-TURBINE GENERATOR STABILITY**

Vernon D Gebben Aug 1977 16 p refs (NASA-TM-X-73745, E-9313, ERDA/NASA/1028-77/3) Avail NTIS HC A02/MF A01 CSDL 10B

High speed horizontal axis wind turbine generators with blades on the downwind side of the support tower require special design considerations to handle disturbances introduced by the flow wake behind the tower. Experiments and analytical analyses were made to determine benefits that might be obtained by using the generator exciter to provide system damping for reducing power fluctuations. Author

**N77-31615\*** Boston Univ., Mass Dept of Chemistry  
**PHOTON ENERGY STORAGE IN ORGANIC MATERIALS: THE CASE OF LINKED ANTHRACENES Technical Report, 1 Nov 1975 - 31 Dec 1976**

Guilford Jones II, William R Bergmark, and Thomas E Reinhardt 15 Mar 1977 32 p refs (Contract N00014-76-C-0442) (AD-A039702 TR-6) Avail NTIS HC A03/MF A01 CSDL 07/4

Criteria for the photochemical storage of solar energy as latent heat are outlined. Energy storing valence isomerizations which may be driven by irradiation and which may be reversed by heating with or without a catalyst are described. Data for photoisomerizations which utilize 300-500 nm radiation with storage capacities of 50-250 cal/g and with storage efficiencies of 5-10% are summarized. New data concerning linked anthracenes which photosomerize with  $\phi = 0.204$  are provided. A photocalorimeter for the measurement of storage enthalpies is described. New systems for the practical conversion of solar energy are suggested. GRA

**N77-31618\*** Argonne National Lab Ill  
**DESIGN AND PERFORMANCE OF LI-AL/IRON SULFIDE CELLS FOR UTILITY ENERGY STORAGE AND ELECTRIC VEHICLES**

R O Ivins, E C Gay, W J Walsh, and A A Chilenskas 1976 27 p refs Presented at 27th Power Symp Atlantic City, 21 Jun 1976

(Contract W-31-109-eng-38)

(CONF-760617-3) Avail NTIS HC A03/MF A01

Results of testing the laboratory-scale cells of prismatic configuration having electrodes fabricated by hot-pressing, electrochemical formation, or vibratory loading are presented. Prismatic cells were operated with specific energies of 115 V-h/kg at the 10-h discharge rate and specific powers of 140 W/kg at full charge and 100 W/kg at 50 percent discharge. Higher performance can be expected from improved cell designs which increase the ratio of electrode and active material weight to total cell weight, replacement of the ceramic fabric separators presently used by ceramic paper separators, and development of cells with lower electrical resistance. The choice of electrode fabrication techniques and cell designs for the second round of industrial contracts are described. The design and performance testing of the cells to date suggest that the technical program goals for both applications can be met. ERA

**N77-31619\*** Sandia Labs, Albuquerque N Mex  
**SOLAR COLLECTION MODULE TEST FACILITY, INSTRUMENTATION FLUID LOOP NUMBER ONE**

T D Harrison, W R Dworzak, and C A Folkner, Jr Jan 1977 40 p

(Contract E(29-1)-789)

(SAND-76-0425) Avail NTIS HC A03/MF A01

While data on mechanical, electrical instrumentation and fluid loops are not sufficient to enable complete planning for every possible test, they are judged adequate to enable initiation and completion on interface specifications with a minimum of additional data and effort. Fluid loop number one is designed to evaluate collectors and components of collectors using Therminol 66 as a heat transfer fluid. Fluid loop number one will deliver heat transfer fluid to the test item at temperatures from 20 C to 315 C (70 F to 600 F) at flow rates from 0.1 gpm to 100 gpm at pressures up to 0.51 MPa (75 psig). Fluid loop number one has a weather station and an HP 2116 minicomputer which is capable of directing the test, acquiring data, and performing calculations. ERA

**N77-31620\*** General Electric Co., Schenectady NY  
**DEMONSTRATION OF AN INDUCTOR MOTOR/ALTERNATOR/FLYWHEEL ENERGY STORAGE SYSTEM Quarterly Progress Report, 28 Jun - 28 Sep 1976**

28 Sep 1976 52 p

(Contract EY-76-C-02-4010)

(COO-4010-1, PR-1) Avail NTIS HC A04/MF A01

Vehicle propulsion concepts utilizing flywheel energy are described. Analyses are presented for sizing an inductor motor/alternator/flywheel for application to a 3000 pound vehicle. Component tradeoffs are included for the inductor motor/alternator drive, the solid state inverter/rectifier, the control circuit, and a composite flywheel. Design specifications for the machine are established and a test plan defined. ERA

**N77-31626#** United Engineers and Constructors, Inc., Philadelphia, Pa

**PRELIMINARY ASSESSMENT OF ECONOMICS OF HYDROGEN PRODUCTION FROM LAWRENCE LIVERMORE LABORATORY ZnSe THERMOCHEMICAL CYCLE**

Sep 1976 239 p refs

(Contract W-7405-eng-48)

(UCRL-13711, UEC-LLL-760920)

Avail NTIS

HC A11/MF A01

The ZnSe H<sub>2</sub> Process is a multi-step thermochemical cycle which involves novel selenium-based chemistry and offers, in principle, the possibility of higher energy efficiency than competitive processes based on water electrolysis. A high temperature heat source such as provided by a gas-cooled nuclear reactor is required. The process in the 60 000 lb/hr reference plant design is 26 percent efficient. The H<sub>2</sub> cost is about \$28/MM Btu. This amount is considerably above the \$5-8/MM Btu estimate for other reported processes for hydrolysis of water. The bulk of the product cost is in capital cost fixed charges. The conceptual capital cost estimate is \$3 100 million, consisting of \$900 million for the UHTR (Ultra High Temperature Reactor) heat source, and \$2,200 million for the ZnSe H<sub>2</sub> process. Selenium and molybdenum availability may be limitations on full scale implementation of the process. ERA

**N77-31627#** Mitre Corp., McLean, Va. METREK Div  
**ECONOMIC ANALYSIS OF SOLAR WATER AND SPACE HEATING**

Nov 1976 312 p refs

(Contract EX-76-C-01-2322)

(DSE/2322-1-Suppl) Avail NTIS HC A14/MF A01

Based on comparison with conventional energy costs, solar water heating and solar space heating installed at an equivalent system cost of \$20 per square foot of collector is competitive today against electric resistance systems throughout most of the U.S. If the system cost is reduced to \$15 per square foot, solar systems become competitive against oil hot water heating and/or oil and electric heat pump space heating in many cities. Finally if the cost should be reduced to \$10 sq ft by 1980 through a combination of technical innovations and incentives, solar hot water and heat would be economically competitive against all residential fuel types. Solar system designs for 13 cities were optimized so as to minimize the life cycle cost over the assumed 20 year life time of the solar energy systems. The major assumptions regarding the solar system, type and use of buildings, financial considerations, and economic environment used in the design optimization are given. ERA

**N77-31628#** California Univ., Livermore. Lawrence Livermore Lab. Energy and Planning Resource Group  
**OIL, GAS, URANIUM, AND THORIUM SUPPLY AND DEPLETION, WITH SPECIAL REFERENCE TO CALIFORNIA**

I. Y. Borg, Randolph Stone and Kenneth P. Puchlik. 24 Dec 1976 239 p refs. Sponsored in part by State Energy Resources and Develop. Comm.

(Contract W-7405-eng-48)

(UCRL-52180) Avail NTIS HC A11/MF A01

The assessment of global resources of gas, oil, uranium, and thorium with emphasis on California is presented. The forecasting of depletion is presented for the resources from the historical production data, the estimate of future production, and the size of the total resource available. Detailed data are provided under the following chapters: methodology, oil supplies, oil depletion forecasts, natural gas supplies, natural gas depletion forecast, uranium supplies, uranium depletion, thorium supply and depletion, and finally a chapter on new work, new appraisals of reserves and undiscovered resources and new studies on pipeline routes that promise to affect national and state planning. ERA

**N77-31629#** Energy Research and Development Administration, Washington, D.C.

**MANAGEMENT PLAN FOR ENHANCED OIL RECOVERY VOLUME 1: PROGRAM STRATEGY**

Feb 1977 358 p refs

(ERDA-77-15/1-Vol-1) Avail NTIS HC A16/MF A01

Development of the base, selection of the five major classes of possible ERDA strategies for analysis, identification of technical and geographical targets for enhanced oil recovery (EOR) initiatives, determination of the feasible set of EOR programs, and prioritization of the candidate EOR programs and development of a recommended 5 year EOR budget are outlined. ERA

**N77-31630#** Sandia Labs., Albuquerque, N. Mex.  
**NATURAL GAS MASSIVE HYDRAULIC FRACTURE RESEARCH AND ADVANCED TECHNOLOGY PROJECT Quarterly Report, Aug - Oct 1976**

C. L. Schuster, ed. Jan 1977 27 p

(Contract EY-76-C-04-0789)

(SAND-76-0723) Avail NTIS HC A03/MF A01

A massive hydraulic fracture experiment was conducted in West Virginia that was one of the field demonstrations of the Eastern Devonian Shale Program. It was the largest gelled water and proppant fracture conducted to date in the eastern United States. The system performed according to design goals after some minor revisions. Data analysis of the results are not very definitive for fracture orientation and some improved techniques are being planned for the follow-on experiments. ERA

**N77-31631#** Oak Ridge National Lab., Tenn.  
**LOW-TEMPERATURE THERMAL ENERGY STORAGE Quarterly Progress Report, Jul - Sep 1976**

H. W. Hoffman and R. J. Kedi. 31 Jan 1977 23 p

(Contract W-7405-eng-26)

(ORNL/TM-5795) Avail NTIS HC A02/MF A01

At ORNL research efforts were continued to (a) develop a time-dependent analytical model that will describe a TES system charged with a phase-change material, (b) measure thermophysical properties and melt-freeze cyclic behavior of interesting PCMs and (c) determine crystal lattice structures of hydrated salts and their nucleators. A report on TES subsystems for application to solar energy sources was completed and is being reviewed. In the area of program management, subcontracts were signed. Detailed reviews were completed for ten unsolicited proposals related to TES. Industries, research institutions, universities, and other national laboratory participation in the TES program, for which ORNL has management responsibilities are listed. ERA

**N77-31632#** Battelle Columbus Labs., Ohio  
**HEAT SOURCE COMPONENT DEVELOPMENT PROGRAM Quarterly Report, Oct - Dec 1976**

William M. Pardue, ed. Jan 1977 81 p refs

(Contract W-7405-eng-92)

(BML-X-676) Avail NTIS HC A05/MF A01

Components for advanced radioisotope heat source applications to be used in advanced static and dynamic power conversion systems are outlined. The specific component development efforts which are described are: improved selective and nonselective vents for helium release from the fuel containment, and improved reentry members, and an improved impact member, singly and combined. The unitized reentry-impact member under development is to be used as a bifunctional ablator. Finally, thermodynamic supporting studies are reported. ERA

**N77-31633#** Electric Power Research Inst., Palo Alto, Calif.  
**PROCEEDINGS OF THE WORKSHOP ON ANALYSIS OF 1974 AND 1975 POWER GROWTH**

Milton F. Searl and Albert N. Halter. Dec 1976 323 p refs. Conf. proc. held at Chicago, 19-20 May 1976.

(EPRI-EA-318-SR, Conf-760595 WS76-52) Avail NTIS HC A14/MF A01

The causes of the low rate of growth in electric power output in 1974 and 1975 are examined. The subject is examined at various levels of aggregation by persons with various institutional affiliations including individual electric utilities. Perspective on national and regional growth in these years is provided by paper industry, by power equipment manufacturers with a major stake in the growth of the industry, by a regional electric reliability council representative, by a member of the

staff of the Federal Energy Administration, and by an econometrician from the Electric Power Research Institute. The relationship between electricity output and the index of industrial production is discussed  
ERA

**N77-31635#** Brookhaven National Lab., Upton, N Y Dept of Applied Science  
**HYDROGEN-HALOGEN ENERGY STORAGE SYSTEM PRELIMINARY FEASIBILITY AND ECONOMIC ASSESSMENT**

S Srinivasan, R S Yeo, and A Beaufrere 1976 7 p refs  
(Contract EY-76-C-02-0016)  
(BNL-22164) Avail NTIS HC A02/MF A01

The hydrogen-chlorine (H<sub>2</sub>-Cl<sub>2</sub>) cell has been suggested as an electric energy storage battery. Recently, this system was proposed for energy storage applications in electric utilities with the following advantages over the batteries and the hydrogen-oxygen (H<sub>2</sub>-O<sub>2</sub>) system which is being considered for the same purpose: (1) since the electrode reactions of H<sub>2</sub> and Cl<sub>2</sub> are quite reversible, one can expect an overall efficiency (electric yields electric) of over 75 percent; (2) the same electrodes can be used as electrocatalysts in both modes (chemical and electricity generation). Therefore, the same electrochemical cell can be used for both functions, which reduces the capital costs; and (3) the reactants for chemical and electricity generation are stored outside the cell which appears beneficial for a weekly cycle. A preliminary technical and economic feasibility assessment of the hydrogen-halogen battery as an electric energy storage system was undertaken and results are presented  
ERA

**N77-31636#** Public Service Electric and Gas Co., Newark, N J  
**ASSESSMENT OF ENERGY STORAGE SYSTEMS SUITABLE FOR USE BY ELECTRIC UTILITIES, VOLUME 3 Final Report**

Jul 1976 112 p refs  
(Contract E(11-1)-2501)  
(EPRI-EM-264-Vol-3) Avail NTIS HC A06/MF A01

The current state of development for conventional and underground pumped hydroelectric power was investigated. Hydroelectric pumped storage was found to be a mature technology, easily implemented where suitable sites are available for two surface reservoirs. It was stated that underground reservoirs extend areas where hydroelectric pumped storage can be used and further development of high head equipment is necessary for use in high head underground plants  
ERA

**N77-31637#** Lewin and Associates, Inc., Washington, D C  
**RESEARCH AND DEVELOPMENT IN ENHANCED OIL RECOVERY PART 1: OVERVIEW Final Report**

Washington D C ERDA Dec 1976 132 p refs 3 Vol  
(Contract EX-76-C-01-2294)  
(ERDA-77-20/1) Avail NTIS HC A07/MF A01

Petroleum dependence and enhanced oil recovery, approach to the analysis, industry's plans for enhanced oil recovery, publicly sponsored R and D in enhanced oil recovery (total estimated production), and analyses for decision making are discussed  
ERA

**N77-31638#** Battelle Columbus Labs., Ohio  
**SURVEY OF THE APPLICATIONS OF SOLAR THERMAL ENERGY SYSTEMS TO INDUSTRIAL PROCESS HEAT. VOLUME 3. SOLAR THERMAL ENERGY SYSTEMS ANALYSIS AND PRELIMINARY ASSESSMENT OF RELATED Nontechnical Issues Final Report**

Jan 1977 258 p refs Prepared in cooperation with Honeywell, Inc.  
(Contract W-7405-eng-92)  
(TID-27348/3-Vol-3) Avail NTIS HC A12/MF A01

The application of solar thermal energy systems to industrial process heat is presented. The details and results of the analysis of the expected performance of solar thermal energy systems designed to supply industrial process heat are presented. The results of a preliminary assessment of nontechnical issues related

to the use of solar energy for process heat i.e., economic, institutional, legal and environmental aspects are also discussed  
ERA

**N77-31639#** Battelle Columbus Labs., Ohio  
**SURVEY OF THE APPLICATIONS OF SOLAR THERMAL ENERGY SYSTEMS TO INDUSTRIAL PROCESS HEAT. VOLUME 2. INDUSTRIAL PROCESS HEAT SURVEY Final Report**

Jan 1977 539 p refs Prepared in cooperation with Honeywell, Inc. 2 Vol  
(Contract W-7405-eng-92)  
(TID-27348/2-Vol-2) Avail NTIS HC A23/MF A01

The detailed results of a survey of the process heat requirements in 20 industries are presented. On the basis of detailed process analysis, a total process heat requirement of 7.87 x 10<sup>10</sup> to the fifteenth power Btu/year has been identified. Not all of industry is covered by these extrapolations; hence these quantities represent minimum values rather than totals for all of industry. Growth projections for each of the industries applied to the extrapolated 20 industry data lead to total process heat quantities of 12.4 x 10<sup>10</sup> to the fifteenth power and 16.8 x 10<sup>10</sup> to the fifteenth power Btu/year for 1985 and 2000, respectively, and to 4.3 and 5.9 x 10<sup>10</sup> to the fifteenth power Btu/year for the same years for the quantities used below 350 F  
ERA

**N77-31642#** Energy Research and Development Administration, Washington, D C  
**ENERGY TECHNOLOGIES FOR THE WEST GEOTHERMAL, ENERGY FROM THE EARTH**

John W Shupe 1976 68 p Workshop held in San Francisco, 21 Sep 1976  
(TID-27431) Avail NTIS HC A04/MF A01

Some of the following topics were discussed at the workshop on geothermal energy: (1) geothermal sources in Hawaii; (2) the philosophy of geothermal energy as an exotic alternative energy source; (3) geothermal development in the Imperial Valley; (4) legal impediments to geothermal development with special comments on the Geothermal Steam Act 1970  
B B

**N77-31643#** Energy Research and Development Administration, Washington, D C  
**ENERGY TECHNOLOGIES FOR THE WEST CAN THE INDIVIDUAL'S VOICE BE HEARD, PUBLIC PARTICIPATION IN ENERGY PLANNING**

Sylvia Siegel 1976 96 p Workshop held in San Francisco, 21 Sep 1976  
(TID-27433) Avail NTIS HC A05/MF A01

The activities and duties of TURN, a consumer representation group, are reported. Several views of various agency heads are presented in relation to consumer influence on energy supply and conservation measures as a part of ERDA's decision making process  
B B

**N77-31644#** Energy Research and Development Administration, Washington, D C  
**ENERGY TECHNOLOGIES FOR THE WEST THE FOSSIL OPTION**

1976 46 p Workshop held in San Francisco, 21 Sep 1976  
(TID-27430) Avail NTIS HC A03/MF A01

The environmental impact of increased coal usage was examined, as well as the problems encountered by coal companies in recent years. Research was presented on alternate energy sources, especially that regarding the bituminous sandstones prevalent in California. A coal desulfurization project being conducted using powdered iron, coal and fuel oil was examined and the space shuttle project and a methane-driven automobile project were briefly mentioned. The direct use of coal was predicted as reaching 24 quads by the year 2000, with coal gasification and liquefaction moving to perhaps 14 quads. Shale oil production could reach 7 quads. The results of a study on manufacturing gas or generating electricity were presented in which coal is used specifically for both processes. The efficiency from an energy

standpoint, cost to the consumer and capital requirements were emphasized ERA

**N77-31645#** Energy Research and Development Administration Washington, D C

**ENERGY TECHNOLOGIES FOR THE WEST WHAT IMPACT COULD ENERGY TECHNOLOGY DEVELOPMENT HAVE ON THE QUALITY OF LIFE**

David O Rankin 1976 71 p Workshop held in San Francisco, 22 Sep 1976

(TID-27428) Avail NTIS HC A04/MF A01

Religion versus science was discussed in terms of the quality of life Other topics covered relating to this main theme included the impact of technological development, social processes, the need for education, and also human consciousness ERA

**N77-31646#** Energy Research and Development Administration Washington, D C

**ENERGY TECHNOLOGIES FOR THE WEST GENERAL SESSION, VOLUME 2**

Paul Valentine 1976 205 p Workshop held in San Francisco 21 Sep 1976

(TID-27427) Avail NTIS HC A10/MF A01

Twelve presentations were made divided into three sub-sessions Session 1 Public Input to Energy Policy Session 2 Energy Demand, and Session 3, Energy Supply Panel discussions following each presentation are reported ERA

**N77-31647#** Energy Research and Development Administration, Washington, D C

**ENERGY TECHNOLOGIES FOR THE WEST FISSION AS AN OPTION**

Roger Griffin 1976 84 p Workshop held in San Francisco 21 Sep 1976

(TID-27432) Avail NTIS HC A05/MF A01

The ERDA-76 energy plan was discussed and criticized It was emphasized that few options exist specifically nuclear and coal, in the near- and mid-term however, concern was voiced regarding irreversible effects commitments and choices Problems of U S energy policy planners with nuclear technology and finances were considered In addition the Colombo Resolution was discussed a plan which would suspend debt payments to the International Monetary Fund and replace that with a development bank for emergency fusion power and agriculture-related industry ERA

**N77-31648#** Energy Research and Development Administration Washington, D C

**ENERGY TECHNOLOGIES FOR THE WEST ECONOMIC GROWTH AND ENERGY**

William Hogan 1976 98 p Workshop held in San Francisco 21 Sep 1976

(TID-27429) Avail NTIS HC A05/MF A01

The implementation and operation of formal models and analyses applied to energy problems were described demonstrating the relationship between economic growth and energy demand and supply Questions of energy supply and conservation practices were reviewed the shortage of natural gas was seen as the most pressing issue in California Comments were made regarding electric energy growth in the western states giving attention to the energy consumption/GNP relationship A group study was then presented which compares the economics of coal-fired and nuclear power plants ERA

**N77-31649#** Little (Arthur D.), Inc Cambridge Mass

**NATIONAL BENEFITS/COSTS OF ENHANCED OIL RECOVERY RESEARCH Final Report**

Aug 1976 75 p

(Contract EX-76-C-01-2021)

(FE-2021-4) Avail NTIS HC A04/MF A01

The primary type of benefit quantified is the national savings to be realized as a result of having cheaper supplementary oil available from enhanced recovery than would be otherwise available under uncertain alternative futures Alternative types of

benefits are also reviewed including those associated with avoiding more expensive re-entry of stripper wells at a later time, with the balance of payments value of enhanced recovered oil and with enhanced recovered oil becoming part of a national emergency stockpile Other benefits unquantified are those associated with insurance and portfolio values Sensitivity of the benefit/cost ratios to alternative assumptions is illustrated through a number of sensitivity analyses These analyses indicate that the expected benefits from the development of enhanced oil recovery technology substantially exceed Federal program costs ERA

**N77-31650#** Lewin and Associates, Inc Washington D C

**RESEARCH AND DEVELOPMENT IN ENHANCED OIL RECOVERY PART 2 THE PROGRAM Final Report**

Dec 1976 296 p

(Contracts EX-76-C-01-2294, E(49-18)-2294)

(ERDA-77-20/2) Avail NTIS HC A13/MF A01

Steam drive, in-situ combustion carbon dioxide miscible flooding, surfactant/polymer flooding and polymer augmented waterflooding are discussed ERA

**N77-31651#** Lewin and Associates Inc Washington, D C

**RESEARCH AND DEVELOPMENT IN ENHANCED OIL RECOVERY PART 3 THE METHODOLOGY Final Report**

Dec 1976 337 p

(E(49-18)-2294)

(ERDA-77-20/3) Avail NTIS HC A15/MF A01

The criteria and procedures used in classifying the reservoir targets reflecting their technological status are discussed The categories include assumptions used in analyzing the sensitivities of the results to alternate price/tax contingencies results of the interviews with government officials and industry representatives models used in the analysis to estimate incremental recovery and economics and the development and use of the technological screening guide ERA

**N77-31653#** Environmental Protection Agency Washington D C

**PHOTOVOLTAIC CONVERSION PROGRAM**

Nov 1976 109 p

(ERDA-76-161) Avail NTIS HC A06/MF A01

A brief but comprehensive overview of the ERDA Photovoltaic Conversion Program is presented It includes the program's goals and objectives strategy program plan and abstracts of individual projects that comprise the program ERA

**N77-31654#** Oak Ridge National Lab Tenn Engineering Technology, Div

**SUMMARY REPORT AN EXPLORATORY STUDY OF COST TARGETS FOR SOLAR ELECTRIC POWER PLANTS**

T D Anderson, H I Bowers, J G Delene L C Fuller, S I Kaplan, and J V Wilson Mar 1977 34 p refs

(Contract W-7405-eng-26)

(ORNL/TM-5787) Avail NTIS HC A03/MF A01

A preliminary evaluation was made of the economic goals that need to be achieved in the solar-electric R and D and demonstration programs so that solar can become a viable component of our national electric energy production system Solar electric technologies considered are solar thermal conversion solar photovoltaic wind energy conversion, and ocean thermal Target costs were developed for selected applications of solar by comparison with known means of accomplishing the same end results The known technologies were assumed to be fossil and nuclear energy sources ERA

**N77-31655#** National Academy of Sciences - National Research Council Washington D C

**NATIONAL RESEARCH COUNCIL COMMITTEE ON NUCLEAR AND ALTERNATIVE ENERGY SYSTEMS Interim Report**

Jan 1977 56 p  
(Contract EX-76-C-10-3784)  
(TID-27435) Avail NTIS HC A04/MF A01

The need for and direction of nuclear power development the various nuclear options being considered in detail, including breeder reactor and associated fuel-cycle technologies were studied. But decisions regarding nuclear energy cannot be made in a contextual vacuum the time scale and the context in which these decisions should be made depend not only on the technical social and economic status and impacts of other energy-supply technologies, but also on assumptions concerning future levels of demand for energy and the possibilities for energy conservation through changes in consumption patterns and improved efficiency of the supply and end-use systems. The study, therefore seeks to relate the many important factors that impinge on ERDA's and the nation's energy decisions and thereby on the ultimate role of nuclear power. ERA

**N77-31656#** Mathematica, Inc., Princeton N J  
**COMPARATIVE STATE-OF-THE-ART ASSESSMENT OF GAS SUPPLY MODELING** Final Report

Robert Ciliano, D R Limaye, and S D Hu Feb 1977 643 p  
refs Sponsored by ERDA and EPRI  
(EPRI-EA-201) Avail NTIS HC A99/MF A01

A state-of-the-art comparison of twelve major gas-supply-modeling efforts is described. As categorized into three general classifications, namely (1) structural models of resource economics (2) pure econometric models, and (3) resource base-geologic models. In addition model-by-model assessments are presented. ERA

**N77-31658#** Army Electronics Command Fort Monmouth, N J  
**A SOLAR POWER RADIACMETER**

Joseph C Nirschl Apr 1977 28 p refs  
(AD-A039995, ECOM-4495) Avail NTIS HC A03/MF A01  
CSCL 18/4

A solar power radiacmeter (breadboard) design is described, based on a miniature (18 cc) ionization chamber and low power, solid-state (Field Effect Transistor, FET) electrometer. Power demand for this instrument, including DC converter, is approximately 5 mW. Preliminary experiments with a 20 sq cm silicon solar cell panel and pen light (AA size) rechargeable (NiCd) battery suggest feasibility of this approach. Solar power intake and dissipation is discussed for experiments conducted.

Author (GRA)

**N77-31660#** Massachusetts Inst of Tech Cambridge Energy Lab

**A USER'S GUIDE TO THE MIT WORLD ENERGY DEMAND DATA BASE PART 2: DATA INDEX**

May 1976 172 p  
(Grant NSF SIA-75-00738)  
(PB-266830/9, MIT/EL-76/011WP-Pt-2,  
NSF/RA-760474-Pt-2) Avail NTIS HC A08/MF A01  
CSCL 10A

This data base is assembled as part of an econometric study of world energy demand. The work is part of a project to develop analytical models of the world oil market. The data description listing is designed to be used both as a general index and as a reference key to the data base. It is concise enough to serve as an overview for an individual who wishes to determine what data is present, and it is indispensable to the on-line user who requires a guide to the mnemonics and abbreviations. GRA

**N77-31661#** Federal Highway Administration, Washington, D C  
Office of Energy Information and Analysis

**FEDERAL ENERGY INFORMATION LOCATOR SYSTEM. ENERGY INFORMATION IN THE FEDERAL GOVERNMENT**

30 Nov 1976 384 p  
(PB-262331/2, FEA/B-76/492) Avail NTIS  
HC A17/MF A01 CSCL 05B

This 1976 update has been prepared from a source survey conducted between August and November 1976. FEILS allows the user to identify Federal agencies collecting specific kinds of

energy data and, therefore, to locate that data. The system itself does not contain the data available in the Federal Government, it is a directory for that data. GRA

**N77-31663#** AIA Research Corp., Washington, D C  
**EARLY USE OF SOLAR ENERGY IN BUILDINGS. A STUDY OF BARRIERS AND INCENTIVES TO THE WIDESPREAD USE OF SOLAR HEATING AND COOLING SYSTEMS**

Aug 1976 195 p refs  
(Grant NSF APR-75-18339)  
(PB-267832/4, NSF/RA-760578) Avail NTIS  
HC A09/MF A01 CSCL 13A

The use of the technology and implementation of the knowledge in the building process is analyzed. A summary structure of incentives is also presented. The results of life cycle cost analyses of fifteen selected solar heating projects, as well as a general overview of the various economic factors relating to the commercialization of solar technology are evaluated. A regulatory analysis of sun rights and land use, building codes, warranties of performance, rights to energy, and the implications of these rights are discussed. GRA

**N77-31664#** Idaho Univ., Moscow Dept of Civil Engineering

**PUMPED STORAGE POTENTIAL OF THE HELL'S CANYON AREA M S Thesis**

Larry Douglas Coupe Apr 1977 143 p refs  
(Contract DI-14-31-0001-5070, OWRT Proj B-037-IDA(1))  
(PB-267722/7, W77-08196) Avail NTIS HC A07/MF A01  
CSCL 10B

The potential for pumped storage hydroelectric development of the Hells Canyon area is reviewed with conclusions drawn from preliminary investigation. Background information covers the concept and application of pumped storage. Hells Canyon's physical characteristics and history and its status as a National Recreation Area. Of eighteen potential storage sites noted, the three most promising are analyzed in detail. For each, preliminary designs were developed as well as computer analyses of the reservoir water level fluctuations that would result from such operations. Each is also analyzed for economic feasibility. Conclusions are that pumped storage in the area is too expensive to be competitive now, but it may be more feasible in the future. GRA

**N77-31665#** National Bureau of Standards, Washington, D C  
**COMPARISON OF COMPUTER-PREDICTED AND OBSERVED ENERGY USES IN A MULTI-FAMILY HIGH-RISE APARTMENT BUILDING** Final Report

James P Barnett and Stanley T Liu Jun 1977 38 p refs  
Sponsored by HUD  
(PB-267829/0, NBSIR-76-1177) Avail NTIS  
HC A03/MF A01 CSCL 10A

A comparison was made of the results of two computer programs, in predicting the energy consumption of a multi-family high rise apartment building located in Omaha, Nebraska. Results are given on a monthly basis for the computed energy values and compared with average monthly values of metered data obtained over a five year period. GRA

**N77-31666#** New York State Assembly Scientific Staff, Albany  
**SOLAR ENERGY APPLICATIONS AND RELATED LEGISLATION**

Donald A Mongitore May 1975 39 p refs Sponsored in part by NSF  
(PB-267901/7, SS-503) Avail NTIS HC A03/MF A01 CSCL 13A

Areas in which there is the greatest potential for state legislative action which would promote the use of solar energy in New York state are presented. Solar energy systems which have the greatest potential for use in New York state are described. The problems facing widespread implementation of these systems are enumerated, and legislative proposals which address these problems are detailed in light of existing legislation in other states and their impact on solar energy use in the state. GRA



N77-31667

**N77-31667#** Water Purification Associates Cambridge, Mass  
Science and Public Policy Program

**WATER REQUIREMENTS FOR STEAM-ELECTRIC POWER  
GENERATION AND SYNTHETIC FUEL PLANTS IN THE  
WESTERN UNITED STATES Final Report, May - Aug  
1976**

H Gold, D J Goldstein, R F Probst, J S Shen and D  
Yung Apr 1977 280 p refs  
(Contract EPA-68-01-1916)  
(PB-268067/7, EPA-600/7-77-037) Avail NTIS  
HC A13/MF A01 CSCL 10B

Procedures are described for the detailed determination of  
the water consumed for mining and processing coal and oil  
shale, and for determining the residuals generated. The processes  
considered are Lurgi Synthane and Synthoil for coal conversion,  
TOSCO II for shale conversion, coal-fired steam electric power  
generation and slurry pipeline. In addition, determinations are  
also made of the water consumed for process cooling, flue gas  
desulfurization, revegetation of mined land solids disposal and  
by evaporation and other uses within the mine-plant complex.

GRA

**N77-31671#** Energy Research and Development Administration,  
Pittsburgh, Pa Energy Research Center

**CHEMICAL CHARACTERIZATION OF DIESEL EXHAUST  
PARTICULATES**

M Mentser and A G Sharkey, Jr Mar 1977 53 p refs  
(PERC/RI-77/5) Avail NTIS HC A04/MF A01

High resolution mass spectrometry was used to analyze the  
organic material associated with diesel exhaust particulates in  
order to detect hazardous compounds. Diesel fuels and respirable  
coal mine dusts were also surveyed. Mass spectra were obtained  
on approximately 50 samples of particulates from diesel engine  
tests. The tests involved precombustion chamber and direct  
injection engines operating in different modes of speed and load  
using three grades of diesel fuel. Distribution of hydrocarbons  
changed in a characteristic manner as the speed and loading of  
the engines increased from idle to rated speed and full load.  
The composition profiles were little affected by engine or fuel  
type. The composition of diesel particulates was investigated as  
a function of particle size from less than 0.2 to greater than or  
approximately equal to 3.0 micrometers.

ERA

**N77-31672#** California Univ., Davis Radiobiology Lab  
**HEALTH EFFECTS OF POLLUTANTS ASSOCIATED WITH  
FOSSIL-FUEL POWER GENERATION. AN INDEXED  
BIBLIOGRAPHY WITH ABSTRACTS**

J Azevedo, K Berding, and S A Book Apr 1976 189 p  
(Contract E(04-3)-0472)

(UCD-472-500) Avail NTIS HC A09/MF A01

Approximately 900 references are contained in this bibliogra-  
phy prepared as part of a risk assessment program. Health hazards  
associated with pollutants generated from fossil fuel combustion  
for electrical power production are evaluated. The articles listed  
comprise the first major section of a continuing literature  
review.

ERA

**N77-31673#** Center for Energy and Environment Research,  
Caparra Heights (Puerto Rico)  
**ECOLOGICAL REVIEW OF HYDROELECTRIC RESERVOIRS  
IN PUERTO RICO**

William R Jobin, Frederick F Ferguson, and Raymond Brown  
Oct 1976 84 p refs Sponsored by ERDA  
(CEER-1) Avail NTIS HC A05/MF A01

Published literature and available data on the ecology of  
hydroelectric reservoirs and other lakes in Puerto Rico was  
reviewed. Various studies on unrelated elements in the aquatic  
ecology were examined. The majority of the island wide studies  
pertained to surveys on snails related to the parasitic disease  
bilharzia. A survey of 28 major lakes in 1976 showed that  
Biomphalaria glabrata was gradually displaced from most of the  
lakes by Marisa cornuarietis and Tarebia granifera, two foreign  
snails which do not transmit bilharzia. Of the 17 lakes contain-

ing B. Glabrata in 1956, only 8 remained infested in 1966 and  
only 5 in 1976, twenty years after the introduction of Marisa  
cornuarietis. Although the trend indicates that the lakes may be  
safe from transmission, a monitoring system is necessary before  
the lakes are used for recreation.

Author

**N77-31674#** Battelle Pacific Northwest Labs., Richland, Wash  
**PACIFIC NORTHWEST REGIONAL ASSESSMENT PRO-  
GRAM Annual Report, 1976**

Jun 1976 40 p refs

(Contract E(45-1)-1830)

(BNWL-2084) Avail NTIS

An integrated analytical assessment program was established  
for evaluation of potential changes that may result from various  
energy development or conservation scenarios. Such scenarios  
may themselves result from Federal development policies and  
programs, from regionally specific actions by the states and energy  
industries, or from actions taken by international factors currently  
importing energy resources into the region. After consideration  
of a variety of approaches to integrated assessment at a regional  
level, dynamic simulation techniques were developed to provide  
the best available approach to evaluating the issues pertinent to  
the Northwest.

ERA

**N77-31675#** Battelle Pacific Northwest Labs., Richland, Wash  
**CHARACTERIZATION OF SUBSTANCES IN PRODUCTS  
EFFLUENTS AND WASTES FROM SYNTHETIC FUEL  
PRODUCTION TESTS Quarterly Progress Report**

M R Petersen, J S Fruchter, and J C Lauf Sep 1976  
27 p

(Contract EY-76-C-06-1830)

(BNWL-2131) Avail NTIS HC A03/MF A02

An up-to-date information on the status of these characteriza-  
tion efforts, both to those concerned with techniques and  
abatement process development and to the biological and  
environmental scientists working in this area is presented.

ERA

**N77-31676#** Pennsylvania Univ., Philadelphia Dept of Regional  
Science

**REGIONAL ECONOMIC IMPACTS OF NUCLEAR POWER  
PLANTS**

Walter Isard, T Reiner, R Vanzele, and J Stratham Aug 1976  
151 p refs

(Contract EY-76-C-02-0016)

(BNL-50562) Avail NTIS HC A08/MF A01

The economic and social impacts of nuclear power facilities  
are compared in the Maryland, New Jersey, and Pennsylvania  
area.

IM

**N77-31685#** Environmental Protection Agency, Ann Arbor, Mich  
Emission Control Technology Div

**AUTOMOBILE EMISSION CONTROL. THE DEVELOPMENT  
STATUS, TRENDS, AND OUTLOOK AS OF DECEMBER  
1976**

Apr 1977 650 p refs

(PB-267865/4) Avail NTIS HC A99/MF A01 CSCL 13B

Significant development trends are highlighted in the following  
areas: 3-way catalysts, improved fuel metering, electronic  
controls, non-catalytic emission control technology, vehicle space  
requirements for emission controls, turbocharging, and diesel  
engine developments. A review of each manufacturer's emission  
control development efforts is included.

GRA

**N77-31725#** Montana Dept of Health and Environmental  
Sciences, Helena

**ALLUVIAL VALLEY FLOORS IN EAST-CENTRAL MONTANA  
AND THEIR RELATION TO STRIPPABLE COAL RESERVES.  
A RECONNAISSANCE REPORT**

Jack Schmidt Jan 1977 148 p refs

(PB-267280/6, EPA-908/4-77-001)

Avail NTIS  
HC A07/MF A01 CSCL 08I

The chief purpose of the project was the preliminary assessment of the impact of a prohibition against mining alluvial valley floors on the coal resources of portions of Dawson, Garfield, McCone and Richland Counties Montana. A secondary purpose was the assessment of some of the physical and land use characteristics of these areas, and their importance to the local farming and ranching economy. Field work, data compilation and report preparation were accomplished in less than five months. GRA

**N77-31814#** Brookhaven National Lab., Upton, N Y  
**ENERGY MODEL DATA BASE (EMDB) USING SYSTEM 2000**

P H Newhouse Sep 1976 22 p Presented at Assoc of System 2000 Users for Tech Exchange Meeting Toronto, 29 Sep 1976

(Contract E(30-1)-16)

(BNL-21854, Conf-760989-1) Avail NTIS HC A02/MF A01

The Energy Model Data Base (EMDB) at BNL is discussed. It contains high-quality, documented numeric data describing the technological processes which comprise the United States Energy System. The EMDb was designed as a collection of energy data to be used in an array of energy systems modeling tasks. The history and use of the EMDb are explained in a nontechnical way. ERA

**N77-31823#** California Univ., Berkeley Dept of Chemistry  
**LARGE SCALE SCIENTIFIC COMPUTATION VIA MINICOMPUTER Final Report, 1973-1976**

William H Miller Sep 1976 100 p refs

(Grant NSF GP-39317)

(PB-267575/9) Avail NTIS HC A05/MF A01 CSCL 07D

A program of research designed to test the suitability of minicomputers for large scale scientific computations is described. The problems attacked are those traditionally done on the largest and fastest commercially available electronic computers: the calculation of potential energy surfaces and the subsequent evaluation of the dynamics of chemical reactions. Cost effectiveness, practical limitations and advantages, and implications of their experience for present and future large scale scientific computations are discussed, not only for minicomputers but also for large computers. GRA

**N77-31824#** Bureau of Mines, Pittsburgh, Pa Eastern Field Operation Center  
**COMPUTER GRAPHICS DEMONSTRATION: AREA COAL AVAILABILITY STUDIES**

John R Bitler and John D Martin 1977 22 p refs

(PB-267923/1, BM-IC-8736) Avail NTIS HC A02/MF A01 CSCL 08I

A computerized mapping system was developed by the Bureau of Mines to provide procedures for the rapid and inexpensive display of coal reserve data. Mapping system output consists of two types of maps: point distribution and contour (isopleth), which can be produced for data (coal analyses) associated with a point location (outcrop, drill core, or mine samples). The primary advantage of this system is that it enables the display of a rapidly changing data base and computerized map generation without the intermediate steps of digitizing and overlaying to produce base maps. The mapping system is applicable to any regional mineral reserve or resource study for which point location data are available. Included are example maps of the distribution of data points and contouring for sulfur content of the Upper Freeport coalbed in the western Pennsylvania demonstration area. GRA

**N77-31945#** Little (Arthur D.), Inc., Cambridge, Mass  
**GAS COOLED REACTOR ASSESSMENT, VOLUME 1 Final Report, 9 Feb. - 30 Jun. 1976**

Aug 1976 143 p refs Prepared in cooperation with United Constructors and Engrs., Inc., Philadelphia (Contract EY-76-C-02-2885)

(TID-27424/1-Vol-1) Avail NTIS HC A07/MF A01

The development and commercialization of the following four reactor types were studied: high temperature gas-cooled reactor-steam cycle, direct conversion high temperature reactors, very high temperature reactors, and gas-cooled fast breeder reactors. The areas of research were as follows: (1) a technical and economic assessment of the status of the different reactor types was performed; (2) a spectrum of scenarios was developed projecting the performance of the reactor types, their areas of potential application and schedule of commercial availability; (3) alternative scenarios were developed for providing required electrical energy within the United States; and (4) commercial deployment strategies for gas-cooled reactors were provided. ERA

**N77-31969#** Battelle Pacific Northwest Labs., Richland Wash  
**DEVELOPMENT AND CHARACTERIZATION OF MATERIALS FOR OPEN CYCLE MHD Quarterly Report, Apr. - Jun 1976**

J Lambert Bates 1976 29 p refs

(Contract EY-76-C-06-1830)

(BNWL-2004-3) Avail NTIS HC A03/MF A01

Activities performed in support of the U S / U S S R magnetohydrodynamic power generation program are described. Progress is reported in characterizing and evaluating materials from the phase 1 U-O<sub>2</sub> test, and developing and fabricating electrodes and insulator materials for the phase 2 test. Procedures were developed for fabricating three MgAl<sub>2</sub>O<sub>4</sub> Fe<sub>3</sub>O<sub>4</sub> electrodes with controlled microstructures. Methods for fabricating applying metal current leadouts to high temperature MHD electrodes were examined. ERA

**N77-31981#** Association Euratom-CEA, Fontenay-aux-Roses (France) Groupe de Recherches sur la Fusion Contrôlée  
**REVIEW OF THE STATE OF THE ART WITH TOKAMAKS IN USSR**

S V Mirmov, V S Mukhovatov, V S Strelkov, and V D Shafranov Jul 1976 35 p refs Transl into FRENCH from Fiz Plazmy (USSR), v 2, 1976 p 348-360 In FRENCH

(EUR-CEA-FC-839-TR) Avail NTIS (US Sales Only) HC A03/MF A01

The U S S R Tokamak program is realized with some fifteen different devices that may be distributed in five groups according to the aim of the research: the T-4, T-10, T-20 Tokamak line is intended for enhancing the plasma parameters due to the increase in the dimensions of the apparatus. The small sized, noncircular section T-8, and T-9 Tokamaks are intended for the search of new configurations, the decrease in the impurity influx is studied on T-12, TO-2, TM-4, TB-0, and the supplementary heating and stabilization are studied on TM-3, Tuman-2 T-11, TF-1, TM-1-HF, TO-1, and Tuman-3. New principles of creating magnetic systems are investigated on T-7. Among these devices seven are now operating: T-4, TM-3, T-9, Tuman-2, TO-1, TF-1, and TM-1-HF. Experiments on T-10, T-8, and T-11 are about to start, T-12, TO-2, TM-4, T-7, and Tuman-3 are in course of construction, and TB-0 and T-20 are still in contemplation. ERA

**N77-32009#** DGS Associates, Inc., Washington, D C  
**THE REPORTING OF FEDERAL RESEARCH AND DEVELOPMENT RESOURCES APPLIED TO INNOVATION Final Report**

Dave G Soergel 18 Apr 1977 32 p ref

(NSF Order 77-SP-0443)

(PB-266765/7) Avail NTIS HC A03/MF A01 CSCL 05A

A system of reporting Federal funding of research and development (R&D) which is based on the design progression phases of the innovative process is presented. The study is limited to investigation of federally funded R&D resource expenditures in hardware production areas. The conceptual approach to

## N77-32016

design progression reporting is based on six supply-oriented design progression phases within the innovative process and a demand-oriented category of mission needs and goals which is delineated through six mission levels. Current Federal R&D resource data for the solar electric technology mission is realigned to this conceptual framework. GRA

**N77-32016#** Battelle Pacific Northwest Labs., Richland Wash  
**ENFORM AN ENERGY INFORMATION SYSTEM**  
C M Heeb, W L Purcell and B M Cole Mar 1977 59 p  
refs  
(Contract EY-76-C-06-1830)  
(BNWL-2195) Avail NTIS HC A04/MF A01

The ENFORM system of computer codes can be used to calculate the amount of fuel material in the nuclear fuel cycle as a function of time. The material amounts are determined by an input schedule of installed electric energy generation capacity. In addition to the amount of uranium and plutonium in the fuel cycle, the system also accounts for 175 radionuclides. The chemical effluents released to the environment are modeled by using simple release factors. All release factors and dose coefficients are specific for each type of plant in the nuclear fuel cycle. The material logistics and effluent accounting features of the ENFORM system are supplemented by a fuel cycle economics package. This module provides fuel cycle processing costs and the leveled cost of power. The ENFORM system also provides means of estimating the effect of changing nuclear growth scenarios and changing environmental control technologies on nuclear fuel cycle effluents, economics and logistics. ERA

**N77-32027#** National Bureau of Standards, Washington, D C  
**DIMENSIONS, VOLUME 61, NO 5 Monthly Report**  
May 1977 35 p refs  
(PB-267321/8, NBS/DIM-61/5) Avail NTIS  
HC A03/MF A01 CSCL 14B

This monthly magazine features short summaries of major technical developments, highlights of work in progress, major speeches and statements by Bureau management, and a listing of NBS publications. The table of contents for the current issue is: Going to extremes in the study of sound; Things your mother never told you about spinach; Liquefied natural gas; NBS issues landmark study on privacy in health records; Resource conservation and recovery; Standards for law enforcement; measurements of earth's motion agree with general relativity theory; Limits of hydrogen liquefier efficiency defined; NBS microscopy resolution test chart SRM accepted for international use; polyethylene proposed for biocompatibility studies; Reference data report; Telecommunications technology and libraries conferences; ACM/NBS systems and software symposium; New SRM price list available from NBS; is hydrogen safe; Thermophysical properties data published. GRA

**N77-32031#** Committee on Science and Technology (U S House)  
**NASA AUTHORIZATION, 1978, VOLUME 1, PART 2**  
Washington GPO 1977 1224 p refs Hearings on H R 2221 (superseded by H R 4088) before Subcomm on Space Sci and Applications of the Comm on Sci and Technol., 95th Congr., 1st Sess., 2, 4-7, and 9 Feb 1977  
(GPO-92-082) Avail Subcomm on Space Sci and Applications

NASA's Office of Space Flight programs are described in support of funding requests and appropriations for FY-1978. Testimony given in field hearings at the Kennedy, Johnson, Marshall and Michoud facilities is documented. ARH

**N77-32032#** Committee on Science and Technology (U S House)  
**NASA AUTHORIZATION, 1978, VOLUME 1, PART 3**  
Washington GPO 1977 933 p refs Hearings on H R 2221 (superseded by H R 4088) before the Suncomm on Space Sci and Applications of the Comm on Sci and Technol., 95th Congr., 1st Sess., 16-17, 23 Feb and 4-6, 7 Mar 1977  
(GPO-92-294) Avail Subcomm on Space Sci and Applications

Present and planned programs for basic scientific exploration and applications of practical technology in space are explored in testimony presented by representatives of various organizations and NASA offices. Field hearings at Rockwell International, the Jet Propulsion Laboratory, McDonnell Douglas and the Boeing Aerospace Co are included. ARH

**N77-32033\*#** Detroit Diesel Allison, Indianapolis Ind  
**STUDY AND PROGRAM PLAN FOR IMPROVED HEAVY DUTY GAS TURBINE ENGINE CERAMIC COMPONENT DEVELOPMENT Final Report**  
H E Helms May 1977 161 p refs Sponsored by ERDA  
(Contract NAS3-20064)  
(NASA-CR-135230 EDR-9068 ERDA/NASA/3-20064/77/1)  
Avail NTIS HC A08/MF A01 CSCL 13F

Fuel economy in a commercially viable gas turbine engine was demonstrated through use of ceramic materials. Study results show that increased turbine inlet and generator inlet temperatures, through the use of ceramic materials, contribute the greatest amount to achieving fuel economy goals. Improved component efficiencies show significant additional gains in fuel economy. Author

**N77-32034#** Defense Intelligence Agency, Washington, D C  
**ELECTRIC VEHICLE RESEARCH, DEVELOPMENT, AND TECHNOLOGY, FOREIGN**  
James D Busi and Lawrence R Turner May 1977 207 p  
refs  
(AD-A040526 DST-1850S-403-77) Avail NTIS  
HC A10/MF A01 CSCL 13/6

The development and production of electric drive vehicles have been successful in the Federal Republic of Germany, Japan, the United Kingdom, USSR, and, to a lesser degree, in France, Italy and Sweden. These vehicles are basically designed for commercial or industrial application, and, in general, a typical vehicle of this type has a maximum range of 95 to 200 km and a maximum speed of 27 km/h. Military applications of electric drive vehicles for transportation and combat are significant because they offer a number of advantages over more conventional drive systems. GRA

**N77-32036#** Oak Ridge National Lab Tenn Regional and Urban Studies Section  
**TRANSPORTATION ENERGY CONSERVATION DATA BOOK, SUPPLEMENT 2**  
D B Shonka Feb 1977 79 p refs Supplement to ORNL-5918  
(Contract W-7405-eng-26)  
(ORNL-5247-Suppl-2) Avail NTIS HC A05/MF A01

Tables, graphs, and other visuals are used to present statistical data on energy use and related activity of the transportation sector. Data in this supplement concentrate on personal travel characteristics and fuel economy options for automobiles. A list of references is provided and an annotated bibliography and glossary is included. ERA

**N77-32051#** Little (Arthur D.), Inc., Cambridge, Mass  
**DESTROYING CHEMICAL WASTES IN COMMERCIAL SCALE INCINERATORS. FACILITY REPORT NO. 2, SURFACE COMBUSTION DIVISION, MIDLAND-ROSS CORPORATION Final Report**  
J W Adams, J C Harris, P L Levins, J L Stauffer, K E Thrun, and L Woodland Dec 1976 162 p Prepared for TRW Systems, Inc., Redondo Beach, Calif  
(Contract EPA-68-01-2966)  
(PB-268232/6 EPA-530/SW-122c 2) Avail NTIS  
HC A08/MF A01 CSCL 13B

The effectiveness of pyrolysis was determined for treatment of three selected chemical wastes: petroleum refinery wastes, styrene production wastes, and rubber manufacturing wastes. The average conversion of organic material in the waste to organic material in the gaseous pyrolyzer effluent was 70 percent for refinery waste, 60 percent for styrene waste, and 80 percent

for rubber waste. In each case the vapor stream contained a wide variety of organic compounds from methane and acetylene to high boiling aromatic liquids and tars, including appreciable concentration of polynuclear aromatic hydrocarbons. The residual ash in each case was 80 percent inorganic material. Technical and economic feasibilities were discussed. GRA

**N77-32092\*** National Aeronautics and Space Administration Langley Research Center Langley Station, Va

**AN OVERVIEW OF CONCEPTS FOR AIRCRAFT DRAG REDUCTIONS**

Jerry N. Hefner and Dennis M. Bushnell. In AGARD Spec Course on Concepts for Drag Reduction. Jun 1977. 30 p. refs

Avail NTIS HC A13/MF A01 CSCL 01A

A current overview of aerodynamic drag reduction concepts which have potential for reducing aircraft fuel consumption is presented. The discussion shows where the greatest percentages of aircraft fuel is burned and what areas have the greatest potential for fuel conservation. The paper deals with aerodynamic improvements and touches only briefly on structural and propulsion improvements. Concepts for reducing pressure drag (i.e., roughness, wave, interference, and separation drag) drag due to lift/induced drag, and skin-friction drag at subsonic and supersonic speeds are emphasized. Author

**N77-32229\*** National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md

**THE ATS-6 POWER SYSTEM HARDWARE IMPLEMENTATION AND ORBITAL PERFORMANCE**

Thomas A. LaVigna and Franklin L. Hornbuckle. Sep 1977. 49 p. refs. (NASA-TP-1023, G-7703X10). Avail NTIS HC A03/MF A01 CSCL 10C

The Applications Technology Satellite-6 power system, a shunt-boost configuration, uses partial shunt regulation of the solar array and a boost regulator for control of battery power. Regulation is provided for three different operating modes: shunt, charge, and boost. This configuration achieves the highest efficiency of power transfer from the solar array to the loads. The excellent dynamic regulation and low output impedance of the power system virtually eliminated the problem of subsystem interactions on the power bus due to conducted interference from load current fluctuations. The performance of the power system continues to be excellent. The solar array degradation (18.5 percent) was less than the specified 20 percent in two years in spite of extreme cycling from -160 C to 60 C. A unique battery cycling regime of discharges varying from 5 percent to 60 percent daily is being encountered. During the second year, noneclipse discharges have occurred twice a day to depths of 35 percent and 45 percent. Battery performance was good with only a small decrease in end-of-discharge voltage. A recent test to evaluate capacity gave 12.4 AH (83% of the nominal capacity of 15 AH) after over 1400 battery discharge cycles. A small increase in the end-of-charge voltage has recently occurred necessitating a change in the charge regime to achieve full charge conditions. Author

**N77-32277\*** Environmental Monitoring and Support Lab., Research Triangle Park, N.C.

**DETERMINATION OF HYDROGEN SULFIDE IN REFINERY FUEL GASES. Final Report**

Joseph E. Knoll. Jan 1977. 40 p. refs. (PB-268240/9, EPA-600/4-77-007). Avail NTIS HC A03/MF A01 CSCL 07D

Test methods for the iodimetric measurement of hydrogen sulfide in refinery fuel gases are known to suffer from serious thiol interferences. An absorbing solution consisting of 0.16 M cadmium sulfate/sulfuric acid at pH 3.0 is shown to be effective for the collection of hydrogen sulfide in the 70-700 mg/cu m range and to be essentially free from interference by up to 1800 mg/cu m of methanethiol. When combined with a single 3 percent hydrogen peroxide impinger, sulfur dioxide interferences

of up to 1,300 mg/cu m are also removed. No measurable interference results from the presence of carbon oxysulfide, ethene, dimethyl sulfoxide, or thiophene. Acetaldehyde and acetone are observed to interfere at the 2,400 and 48,000 mg/cu m level, respectively. ERA

**N77-32295\*** Kentucky Univ., Lexington. Inst. for Mining and Minerals Research

**METALLURGICAL ANALYSIS OF A PLAIN CARBON-STEEL PLATE AFTER LONG-TERM SERVICE IN A COAL GAS-IFIER**

J. R. Fischer, J. DeAngelis, P. P. Gillis and O. J. Hahn. Apr 1977. 58 p. refs. (PB-268106/2, IMMR27-PD16-77). Avail NTIS HC A04/MF A01 CSCL 11F

A steel inner liner which was directly exposed to a coal gasification reaction for 20 years was examined. The microstructure was observed, the mechanical properties measured, and the chemical composition analyzed as functions of position in the vessel. Evidence of corrosion embrittlement and carburization was sought. Microstructural variations were rationalized, and a correlation of microstructure and mechanical properties was attempted. The initial properties of the steel were estimated and compared to the final measured properties. Certain conclusions were reached concerning the operating conditions of the vessel, and the suitability of the material for its design environment. GRA

**N77-32335\*** Federal Power Commission, Washington, D.C. Bureau of Power

**SUMMARY OF COST AND QUALITY OF ELECTRIC UTILITY PLANT FUELS, 1976**

May 1977. 164 p. (PB-267368/9). Avail NTIS HC A08/MF A01 CSCL 21D

Tables are presented showing the 1976 annual cost and quality data for electric power plant fuels. Contents include information on origin-by-destination, destination-by-origin, and quantity of coal complying with sulfur regulations. Author (GRA)

**N77-32422** Stanford Univ., Calif.

**NUMERICAL SOLUTION OF HEAT CONDUCTION WITH PHASE CHANGE IN CYLINDRICAL SYSTEMS**

Ph.D. Thesis. Mustafa Sengul. 1977. 221 p.

Avail Univ. Microfilms. Order No. 77-12697

Solutions were generated for the range of values of the three parameters typically found in Alaska's North Slope. It is found that the relationship between the dimensionless radius of the thawed permafrost region and dimensionless time can be expressed by a simple power law equation containing two constants. The relationships among these two constants and the three dimensionless parameters are given in two correlating curves. These correlations can be used to forecast the radius of the thawed permafrost region and its temperature distribution at any given time. Dissert. Abstr.

**N77-32435\*** National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

**MAGNETIC HEAT PUMPING. Patent Application**

Gerald V. Brown, inventor (to NASA). Filed 31 Aug 1977. 21 p. (NASA-Case-LEW-12508-2, US-Patent-Appl-SN-829319). Avail NTIS HC A02/MF A01 CSCL 20D

A method of magnetic heat pumping is provided which is applicable at room temperature and below. The method employs a ferromagnetic or ferrimagnetic element whose state, as represented on a temperature-magnetic entropy diagram, repeatedly is caused to traverse a loop. This method operates as a result of temperature and magnetic field control. A regenerator is utilized to enhance desired cooling or heating effects. NASA

**N77-32508#** Environmental Protection Agency, Ann Arbor, Mich  
Emission Control Technology Div  
**AUTOMOBILE EMISSION CONTROL TECHNOLOGICAL  
APPROACHES TOWARD IMPROVING IN-USE VEHICLE  
EMISSIONS PERFORMANCE Final Report**

Sep 1976 45 p  
(PB-267537/9) Avail NTIS HC A03/MF A01 CSCL 21G

Currently available data sources are employed in ascertaining the cause(s) for differences in emission-related state-of-tune. Potential technical solutions are explored and evaluated. Technological approaches to improving in-use performance of vehicles are divided into two classes: those involving technological changes to the vehicle, and those involving technological changes in areas other than to the vehicle. GRA

**N77-32564\*#** National Aeronautics and Space Administration  
Marshall Space Flight Center, Huntsville, Ala  
**INTRODUCTION MAN AND HIS TOTAL ENVIRONMENT**

*In its NASA Workshop on Solar-Terrest Studies from a Manned Space Station 1977 5 p*

Avail NTIS HC A03/MF A01 CSCL 13B

Environmental changes and the utilization of finite resources are analyzed. Beyond the satisfaction of basic physical needs, the advancement of civilization toward an ever-improving quality of life is likewise dependent upon man's interaction with his entire environment. This larger system is controlled externally by electromagnetic and particle energy from the sun and internally by the dynamic interchange of energy between the solid earth, oceans, the atmosphere, and the magnetosphere. This exchange of energy that determines the structure of the earth's environmental system is evaluated. Author

**N77-32563#** Geological Survey, Washington, D C  
**MINERAL RESOURCES POTENTIALS AND PROBLEMS**  
Walden P Pratt and Donald A Brobst 1974 23 p refs  
(USGS-Circ-698) Avail NTIS USGS

The resources of 27 mineral commodities of major importance to our industrial civilizations (based on dollar value) are summarized. The problems involved in the utilization of these resources of the 10 most important nonferrous metals, the 11 principal ferrous metals, and the six principal fossil and nuclear fuels are discussed. Author

**N77-32574#** Utah Univ., Salt Lake City Dept of Geology and Geophysics

**EARTHQUAKE SURVEYS OF THE ROOSEVELT HOT SPRINGS AND THE COVE FORT AREAS, UTAH, VOLUME 4 Final Report**

T L Olson and R B Smith Oct 1976 94 p refs  
(Grants NSF AER-74-01043)  
(PB-268421/5 NSF/RA-760752) Avail NTIS  
HC A04/MF A01 CSCL 08I

Forty-nine days of earthquake monitoring around the Roosevelt Hot Springs KGRA during 1974 and 1975 indicates little earthquake activity and no correlation with the Hot Springs area. Marked earthquake activity, however, was located 25 km east within the Cove Fort-Sulphurdale KGRA. A total of 163 earthquakes were located from the two surveys. Focal depths for the Cove Fort area were shallow with 75% of the activity less than 5 km in depth. The maximum calculated depth was 16 km. Composite fault plane solutions in the Cove Fort area showed normal faulting with generally east-west trending T-axes. A high b-value of 1.27 and a statistical analysis using the Kolmogorov model of event occurrence imply swarm-like activity near Cove Fort. Consistently positive P-wave residuals of up to 0.10 sec and detectable S-wave attenuation of ray paths across the Mineral Range are suggestive of the possibility of an upper-crustal zone of high attenuation that is perhaps related to the source of heat of the Roosevelt Hot Springs KGRA. GRA

**N77-32577#** Utah Univ., Salt Lake City Dept of Geology and Geophysics  
**THERMAL GRADIENT AND HEAT FLOW DRILLING, VOLUME 5 Final Report**

J A Whelan Jan 1977 55 p  
(Grant NSF AER-74-01043)  
(PB-268422/3 NSF/RA-770094) Avail NTIS  
HC A04/MF A01 CSCL 08I

The drilling of nine drill thermal gradient/heat flow holes during the summer of 1975 by the Department of Geology and Geophysics is discussed. Three of these were heat flow holes, two were alteration study holes and two were temperature gradient holes. Drilling methods, hole depths and drill types are outlined. GRA

**N77-32578#** Utah Univ., Salt Lake City Dept of Geology and Geophysics

**GRAVITY AND GROUND MAGNETIC SURVEYS OF THE CENTRAL MINERAL MOUNTAINS, UTAH, VOLUME 6 Final Report. M.S. Thesis**

Terry J Crebs and K Cook Dec 1976 149 p refs  
(Grant NSF AER-74-01043)  
(PB-268423/1 NSF/RA-760753-Vol-6) Avail NTIS  
HC A07/MF A01 CSCL 08I

Data from gravity and ground magnetic surveys made over the central part of the Mineral Mountains and vicinity, Utah, were compiled as a terrain-corrected Bouguer gravity anomaly map. Gravity features include generally northward trending gravity contours with gradients along the margins of the Mineral Range, and a northward-trending gravity high along the western flank of the Mineral Range. GRA

**N77-32579#** Dow Chemical Co., Freeport, Tex  
**ENVIRONMENTAL ASSESSMENT OF GEOPRESSURED WATERS AND THEIR PROJECTED USES Final Report**

J S Wilson, J R Hamilton, J A Manning, and P E Muehlberg  
Apr 1977 99 p refs  
(Contract EPA-68-02-1329)  
(PB-268289/6 EPA-600/7-77-039) Avail NTIS  
HC A05/MF A01 CSCL 08I

Potential uses of the deep geopressured reservoirs of Texas and Louisiana Gulf Coast sedimentary basins are considered along with environmental aspects. Also taken into account are the projected resulting emissions of such uses, other impacts upon the land, the present stage of development and projections of future developmental plans. Author

**N77-32580\*** National Aeronautics and Space Administration  
Pasadena Office, Calif

**SOLAR PHOTOLYSIS OF WATER Patent**

Porter R Ryason, inventor (to NASA) (JPL) Issued 30 Aug 1977 6 p. Filed 13 Feb 1976. Supersedes N76-18680 (14-09, p 1154). Sponsored by NASA.  
(NASA-Case-NPO-13675-1, US-Patent-4,045,315,  
US-Patent-Appl-SN-658132, US-Patent-Class-204-157 1R,  
US-Patent-Class-250-527) Avail US Patent Office CSCL 10B

Hydrogen is produced by the solar photolysis of water in a first photooxidation vessel with a transparent wall in the presence of a water soluble photooxidizable reagent and an insoluble hydrogen recombination catalyst. Simultaneously oxygen is produced in a second photoreduction reactor with a transparent wall in the presence of an insoluble photoreduction reagent catalyst. When spent, the solution from the first reactor is fed into the second reactor. A reaction occurs in the dark in which the redox reagents are regenerated, and the regenerated photooxidation reagent solution is recycled to the first reactor. The photoreduction-catalyst is a bifunctional reagent catalyst including a transition metal salt together with a hydroxyl or chlorohydroxyl decomposition catalyst of high area.

Official Gazette of the U S Patent Office

**N77-32581\*** National Aeronautics and Space Administration  
Pasadena Office, Calif

**LOW TO HIGH TEMPERATURE ENERGY CONVERSION SYSTEM Patent**

Charles G Miller, inventor (to NASA) (JPL) Issued 30 Aug 1977 9 p Filed 27 Dec 1974 Supersedes N75-16972 (13 - 08, p 0505) Sponsored by NASA  
(NASA-Case-NPO-13510-1 US-Patent-4,044,821  
US-Patent-Appl-SN-536786 US-Patent-Class-165-2,  
US-Patent-Class-62-4, US-Patent-Class-126-263,  
US-Patent-Class-165-107) Avail US Patent Office CSCL 10A

A method for converting heat energy from low temperature heat sources to higher temperature was developed. It consists of a decomposition chamber in which ammonia is decomposed into hydrogen and nitrogen by absorbing heat of decomposition from a low temperature energy source. A recombination reaction then takes place which increases the temperature of a fluid significantly. The system is of use for the efficient operation of compact or low capital investment turbine driven electrical generators, or in other applications, to enable chemical reactions that have a critical lower temperature to be used. The system also recovers heat energy from low temperature heat sources, such as solar collectors or geothermal sources, and converts it to high temperatures. Official Gazette of the US Patent Office

**N77-32582\*** National Aeronautics and Space Administration  
Pasadena Office, Calif

**SOLAR ENERGY COLLECTION SYSTEM Patent**

M Kudret Selcuk, inventor (to NASA) (JPL) Issued 30 Aug 1977 8 p Filed 28 Apr 1976 Supersedes N76-26691 (14 - 17, p 2218) Sponsored by NASA  
(NASA-Case-NPO-13810-1, US-Patent-4,044,753,  
US-Patent-Appl-SN-681096 US-Patent-Class-126-271,  
US-Patent-Class-126-270, US-Patent-Class-60-641,  
US-Patent-Class-52-117) Avail US Patent Office CSCL 10A

An improved solar energy collection system, having enhanced energy collection and conversion capabilities is delineated. The system is characterized by a plurality of receivers suspended above a heliostat field comprising a multiplicity of reflector surfaces, each being adapted to direct a concentrated beam of solar energy to illuminate a target surface for a given receiver. A magnitude of efficiency, suitable for effectively competing with systems employed in collecting and converting energy extracted from fossil fuels, is indicated.

Official Gazette of the US Patent Office

**N77-32583\*** National Aeronautics and Space Administration  
Pasadena Office Calif

**THREE-DIMENSIONAL TRACKING SOLAR ENERGY CONCENTRATOR AND METHOD FOR MAKING SAME Patent**

Charles G Miller (JPL) and Jens G Pohl, inventors (to NASA) (JPL) Issued 6 Sep 1977 6 p Filed 28 Apr 1976 Supersedes N76-26689 (14 - 17, p 2218) Sponsored by NASA  
(NASA-Case-NPO-13736-1, US-Patent-4,046,462,  
US-Patent-Appl-SN-681017, US-Patent-Class-350-295,  
US-Patent-Class-350-320, US-Patent-Class-427-130,  
US-Patent-Class-427-47, US-Patent-Class-52-2) Avail US Patent Office CSCL 10A

A three dimensional tracking solar energy concentrator, consisting of a stretched aluminized polymeric membrane supported by a hoop, was presented. The system is sturdy enough to withstand expected windage forces and precipitation. It can provide the high temperature output needed by central station power plants for power production in the multi-megawatt range.

Official Gazette of the US Patent Office

**N77-32584#** Stanford Univ, Calif

**EVALUATION OF THE CdS/CdTe HETEROJUNCTION SOLAR CELL Ph D Thesis**

Kim W Mitchell 1977 151 p

Avail Univ Microfilms Order No 77-12670

A variety of CdS/CdTe heterojunction solar cells have been prepared by the vacuum evaporation of n-CdS films onto

single-crystal p-CdTe substrates. Comparisons have been made between cells prepared using different substrate resistivities, substrate surface preparations and CdS film resistivities. The mechanisms controlling the dark junction current, photocarrier collection, and photovoltaic properties with junction interface states present are modeled. The cells prepared on CdTe surfaces etched with methanolbromine are significantly better than those prepared on mechanically polished surfaces. Dissert Abstr

**N77-32585** Texas Univ, Austin

**NUMERICAL SIMULATION OF UNITED STATES GULF COAST GEOTHERMAL GEOPRESSURED RESERVOIRS Ph.D. Thesis**

Ombo Ferguson Isokrani 1976 312 p

Avail Univ Microfilms Order No 77-11531

Multiphase fluid flow equations and constitutive relationships describing deformable, anisotropic, heterogeneous, and nonisothermal reservoirs such as the Gulf Coast geopressured geothermal aquifers were derived. This mathematical model has been numerically solved using a computer program. Reservoir drive mechanisms considered include fluid and rock matrix compressibilities, formation compaction, shale water influx, fluid expansion and natural gas in solution. Gravity, capillarity, and pressure and temperature dependence of fluid densities, viscosities, natural gas solubility in water, and gas deviation factors have been considered. The computer program was used to analyze the reservoir drive mechanisms of fluid and rock matrix compressibilities, formation compaction, shale water influx, natural gas dissolved in geopressured waters, and fluid expansion. Long-term forecasts of performance using various extraction strategies were made. Permeability, multiple wells, and thermal sensitivity analyses were made. Dissert Abstr

**N77-32586** Texas Univ, Austin

**AN INVESTIGATION OF PERISTALTIC PUMPING PHENOMENA WITH WIND ENERGY APPLICATIONS Ph D Thesis**

Dennis Eugene Wilson 1976 201 p

Avail Univ Microfilms Order No 77-11608

An analytical investigation of peristaltic transport by means of a transverse traveling, or bending wave imposed on the boundary of a circular cylinder is conducted to determine the efficiency of this mode of mass transport. An analytical study is made to determine what aerodynamic force and system parameters are responsible for an unstable bending wave (galloping) in a flexible hollow circular cylinder supported at both ends and filled with a fluid. Dissert Abstr

**N77-32587#** Minnesota Univ, Austin

**RADIATIVE CHARACTERISTICS OF METALLIC PARTICLE COATINGS AND THEIR APPLICATIONS IN SELECTIVE SOLAR ENERGY COLLECTORS Ph D Thesis**

Chong-Won Lee 1976 331 p

Avail Univ Microfilms Order No 77-12830

Optically selective solar collector coatings were theoretically and experimentally investigated. A particular type of selective surface consisting of small metallic particles in a transparent dielectric matrix was studied using mathematical modeling and analysis. Results indicated gold and copper show favorable optical characteristics and can be produced easily, however mechanical strengths of these films was extremely low. Dissert Abstr

**N77-32588** Alabama Univ, University

**UNIT COMMITMENT IN LARGE POWER SYSTEMS ECONOMIC PRIORITIES OF STEAM UNITS AND APPLICATIONS OF PUMPED-STORAGE GENERATION Ph D Thesis**

Ralph McFarland Burns 1976 104 p

Avail Univ Microfilms Order No 77-12173

The use of an economic priority ranking of generating units called a priority list is considered. The way in which use of the priority list reduces the number of possible combinations of generating units is shown. Several methods for obtaining priority lists are presented and compared. Comparison is based on the production costs obtained with unit commitment solutions in which the various priority lists are employed in computing the

respective solutions Based on these comparisons, the dynamic priority list is found to give the least-cost unit commitment solutions An algorithm is given which can be used to obtain a dynamic priority list Pumped-storage hydroelectric generation examined in detail Its use in a large power system along with other types of generation is considered, with emphasis on peaking generation and system operating economics

Dissert Abstr

**N77-32589+** Laboratoires d'Electronique et de Physique Appliquee, Paris Limeil-Brevannes (France)  
**INSTALLATION IN DAKAR OF A PUMP POWERED BY SOLAR CELL PANELS Final Report [MISE EN PLACE A DAKAR D'UNE POMPE ALIMENTEE PAR DES PANNEUX DE CELLULES SOLAIRES]**

C J Naaijer Jun 1976 44 p ref In FRENCH

(Contract DGRST-75-7-1302)

Avail NTIS HC A03

The installation of a solar-powered water pumping system in Dakar (Franch Sahara) is described The interrelation of the various constraints is detailed together with the reasons for choosing photovoltaic cells The solar collector pump, engine, buffer battery, and control unit are discussed The functional characteristics for the automation of the system are elaborated upon

ESA

**N77-32590\*** Spectrolab, Inc., Sylmar, Calif  
**AUTOMATED FABRICATION OF BACK SURFACE FIELD SILICON SOLAR CELLS WITH SCREEN PRINTED WRAP-AROUND CONTACTS Final Report**

J W Thornhill Aug 1977 49 p

(Contract NAS3-20029)

(NASA-CR-135202, Rept-380-5313)

Avail NTIS

HC A03/MF A01 CSCL 10A

The development of a process for fabricating 2 x 4 cm back surface field silicon solar cells having screen printed wraparound contacts is described This process was specifically designed to be amenable for incorporation into the automated nonvacuum production line Techniques were developed to permit the use of screen printing for producing improved back surface field structures, wraparound dielectric layers, and wraparound contacts The optimized process sequence was then used to produce 1852 finished cells Tests indicated an average conversion efficiency of 11% at AMO and 28 C, with an average degradation of maximum power output of 1.5% after boiling water immersion or thermal shock cycling Contact adherence was satisfactory after these tests, as well as long term storage at high temperature and high humidity

Author

**N77-32592\*** Thermo Electron Corp., Waltham, Mass  
**HIGH EFFICIENCY THERMIONIC CONVERTER STUDIES Technical Report, 1 Jul 1976 - 30 Apr. 1977**

F N Huffman, A H Sommer C L Balestra, T R Briere, D P Lieb, P E Oettinger, and D B Goodale Jul 1977 98 p refs

(Contract NAS3-20302)

(NASA-CR-135263, TE-4233-152-77)

Avail NTIS

HC A05/MF A01 CSCL 10A

Research in thermionic energy conversion technology is reported The objectives were to produce converters suitable for use in out of core space reactors, radioisotope generators, and solar satellites The development of emitter electrodes that operate at low cesium pressure, stable low work function collector electrodes, and more efficient means of space charge neutralization were investigated to improve thermionic converter performance Potential improvements in collector properties were noted with evaporated thin film barium oxide coatings Experiments with cesium carbonate suggest this substance may provide optimum combinations of cesium and oxygen for thermionic conversion

Author

**N77-32593\*** Jet Propulsion Lab., Calif Inst of Tech., Pasadena  
**EVALUATION OF BATTERY MODELS FOR PREDICTION OF ELECTRIC VEHICLE RANGE**

H A Frank and A M Phillips 1 Aug 1977 67 p  
(Contract NAS7-100)

(NASA-CR-155045, JPL-Publ-77-29)

Avail NTIS

HC A04/MF A01 CSCL 10C

Three analytical models for predicting electric vehicle battery output and the corresponding electric vehicle range for various driving cycles were evaluated The models were used to predict output and range and then compared with experimentally determined values determined by laboratory tests on batteries using discharge cycles identical to those encountered by an actual electric vehicle while on SAE cycles Results indicate that the modified Hoxie model gave the best predictions with an accuracy of about 97 to 98% in the best cases and 86% in the worst case A computer program was written to perform the lengthy iterative calculations required The program and hardware used to automatically discharge the battery are described

Author

**N77-32594\*** Jet Propulsion Lab., Calif Inst of Tech., Pasadena  
**AN INITIAL COMPARATIVE ASSESSMENT OF ORBITAL AND TERRESTRIAL CENTRAL POWER SYSTEMS Final Report**

Richard Caputo 15 Mar 1977 158 p refs

(Contract NAS7-100)

(NASA-CR-155042, JPL-Publ-77-44)

Avail NTIS

HC A08/MF A01 CSCL 10B

A silicon photovoltaic orbital power system which is constructed from an earth source of materials, is compared to likely terrestrial (fossil, nuclear, and solar) approaches to central power generation around the year 2000 A total social framework is used that considers not only the projection of commercial economics (direct or in internal costs), but also considers external impacts such as research and development investment, health impacts, resource requirements, environment effects, and other social costs

Author

**N77-32596\*** National Bureau of Standards Washington, D C  
Inst for Applied Technology  
**TECHNICAL GUIDELINES FOR ENERGY CONSERVATION Final Report, Dec 1975 - Mar 1977**

Jun 1977 404 p refs

(AD-A041668, NBSIR-77-1238, AFCEC-TR-77-12)

Avail

NTIS HC A18/MF A01 CSCL 10/1

This report provides detailed technical material on various energy conservation actions for existing Air Force facilities and utility systems It is specifically tailored to serve as a working document for Base engineers and technical personnel The report covers energy conservation for Air Force facilities including the equipment for providing hot water space heating and cooling, lighting, and humidification It also covers central plant systems and underground distribution systems (hot water, steam, and chilled water) This volume includes the following topics Energy Conservation Measures for Exterior Building Envelopes, Modifying Mechanical Systems and Operating Practices for Energy Conservation, Conducting the Building Survey, Measurements for identifying Energy Conservation Potential, Economic Analysis and Appendices--Heat transfer fundamentals, Solar energy systems for Air Force applications, Heat and Chilled water distribution systems, and Survey of computer programs for evaluating building and system performance

GRA

**N77-32597\*** Army Construction Engineering Research Lab., Champaign, Ill

**MARKET EVALUATION STUDY: SOLAR HEATING AND DOMESTIC HOT WATER HEATING IN DOD BUILDINGS Final Report**

L M Windigland and C Martel Jul 1977 32 p refs

(FEA Order CG-05-50083-00(1))

(AD-A042178, CERL-TR-E-114)

Avail NTIS

HC A03/MF A01 CSCL 10/1

This study assesses the potential market for combined solar space heating and domestic hot water heating in Department of Defense (DoD) buildings The study considers eight building categories family housing, bachelor enlisted quarters bachelor officers quarters, administration, training, operational, community support, and recreational, which together contain 683 million sq

ft (61.5 million sq m) or 40 percent of the DoD inventory. All buildings were assumed to be oil heated. The buildings were grouped by climatological/solar regions, and the loads for each building type were determined by using the Energy Utilization Index (EUI) method. Solar system performance in each region was obtained by using the U.S. Army Construction Engineering Research Laboratory universal curve method. The life-cycle costs of providing solar space heating and domestic hot water heating were analyzed, and the DoD market potential for installed solar system costs of \$9, \$15, and \$20 per square foot was determined. The study shows that at an estimated initial fuel cost of \$3.50 MBtu for oil heating, a 10 percent cost of money, and an 8.5 percent overall fuel inflation factor, solar systems for space heating and domestic hot water heating become economically feasible when installed system costs are \$14/sq ft (150/sq m). When installed system costs reach \$9/sq ft (\$97/sq m), the market potential becomes 172 million sq ft (15.5 million sq m) of solar collectors. The study also shows the largest potential market at these economic conditions to be family housing which contains a total of 102 million sq ft (9.2 million sq m).

Author (GRA)

**N77-32599#** Air Force Aero Propulsion Lab., Wright-Patterson AFB, Ohio

**DEMONSTRATION TESTING OF A VUILLEUMIER CRYO-COOLER WITH AN INTEGRAL Final Report, Sep - Dec. 1976**

Jerry E. Beam and Tom Mahefkey Jun 1977 69 p refs (AF Proj 2126, AF Proj 0310)

(AD-A042786, AFAPL-TR-77-10) Avail NTIS HC A04/MF A01 CSCL 10/3

The performance of heat pipe/thermal energy storage unit (HP/TESU) powering a Vuilleumier (VM) cryocooler during simulated orbital eclipse periods was demonstrated. Operation with the HP/TESU was shown to have no significant cold stage performance penalty on the VM. The power consumption rate of the VM was determined to be approximately one-half the nominal design value (750 wt) due probably to high first stage heat leaks. VM cold stage performance was stable over large hot cylinder temperature variations (50-100 C). No thermo-mechanical or integration problems were incurred. Operation of HP/TESU as a combined thermal storage medium and hot cylinder heating mechanism is feasible.

Author (GRA)

**N77-32601#** Resources for the Future, Inc., Washington, D.C. **WORKSHOP TO REVIEW FEA'S 1976 NATIONAL ENERGY OUTLOOK Final Report**

Hans H. Landsberg Mar 1977 342 p refs (Grant NSF PRA-76-80248)

(PB-268149/2) Avail NTIS HC A15/MF A01 CSCL 10A

An evaluation of National Energy Outlook, 1976 was evaluated and subjected to discussion in papers commissioned from 10 expert analysts and in a 2-day workshop attended by knowledgeable participants from industry, research organizations, including universities, and government.

GRA

**N77-32603#** Texas A&M Univ., College Station Dept. of Chemical Engineering

**FURTHER DEVELOPMENT OF THE COMPRESSED-FILM FLOATING-DECK SOLAR WATER HEATER**

R. R. Davison Apr 1977 84 p (Grant NSF AER-73-03172-A01)

(PB-268514/7, NSF/RA-770099) Avail NTIS HC A04/MF A01 CSCL 13A

This heater with integral storage and low heat capacity solves many of the problems typical of large horizontal pillow type solar heaters. Two highly instrumented, small-scale models of the Compressed-Film Floating-Deck heater were built and tested. Operation was satisfactory and results typical of flat plate collectors. Design specifications for large-scale floating-deck collectors were developed, and a 500 sq ft unit was built and tested.

GRA

**N77-32604#** Rutgers - The State Univ., New Brunswick, N.J. **SILICON SCHOTTKY PHOTOVOLTAIC DIODES FOR SOLAR ENERGY CONVERSION**

Wayne A. Anderson May 1977 23 p (Grant NSF AER-73-03197)

(PB-268457/9, NSF/RANN/SE/AER73-03197/PR-77,

NSF/RA-770098) Avail NTIS HC A02/MF A01 CSCL 10B

Processing variables are studied using substrate heating, substrate biasing and sputtered-top metal layers. The Schottky process is also applied to ribbon silicon and polysilicon to investigate the efficiency as applied to continuous fabrication techniques. The interfacial insulating layer is made to correlate layer thickness and composition with solar cell performance. Scanning electron microscope and Auger spectrographic analysis is used with electronic tests to investigate this effect.

GRA

**N77 32605#** Nevada Legislative Counsel Bureau, Carson City Legislative Commission

**STUDY OF ELECTRIC AND GAS UTILITIES AND THE PUBLIC SERVICE COMMISSION OF NEVADA**

Sep 1976 114 p

(PB-268481/9, Bull-77-2) Avail NTIS HC A06/MF A01 CSCL 10B

A partial listing of contents includes: alternative sources of energy; utility industry financing requirements; study of environmental laws; study of Public Service Commission of Nevada; and energy conservation.

GRA

**N77-32606#** Nuclear Regulatory Commission, Washington, D.C. **IMPROVING REGULATORY EFFECTIVENESS IN FEDERAL/STATE SITING ACTIONS ALTERNATIVE FINANCING METHODS Final Report**

Daniel J. Evans Jun 1977 36 p refs

(PB-269390/1, NUREG-0204) Avail NTIS HC A03/MF A01 CSCL 10B

The elements of a rational national energy policy are reviewed. An exploration of alternative financing methods for energy planning follows. Recommended basic financing follows from a Federal Energy Tax coupled with tax credit provisions for State efforts. A tax of no more than 0.1 mill per kilowatt hour enacted at the national level could produce ample funds for an equivalent tax on other fuels based on BTU equivalents, tax credit provision that would transfer up to two-thirds mill per kilowatt hour from the Federal government to States, a bonus incentive for regional planning, and a conservation tax that would encourage a more significant response to conservation.

GRA

**N77-32607#** George Washington Univ., Washington, D.C. Energy Policy Research Project

**TRENDS IN WORLD OIL PRICES AND PRODUCTION Final Report**

William A. Johnson Oct 1974 18 p

(Grant NSF OEP-75-01111)

(PB-268411/6, NSF/PRA-7501111/1/5) Avail NTIS HC A02/MF A01 CSCL 21D

The decision made by OPEC members in 1974 to change the method by which world oil prices were determined is examined. The probable impact of the lowering of differentials between equity and participation oil prices was analyzed.

GRA

**N77-32609#** Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho

**BENEFICIAL USES OF GEOTHERMAL ENERGY DESCRIPTION AND PRELIMINARY RESULTS FOR PHASE 1 OF THE RAFT RIVER IRRIGATION EXPERIMENT**

R. C. Schmitt and S. G. Spencer Jan 1977 84 p

(Contract EY-76-C-07-1570)

(TREE-1048) Avail NTIS HC A04/MF A01

An experiment using geothermal water for irrigation is described and preliminary results are discussed. The water from a moderate temperature well, having salinity of about 2000 ppm, is considered characteristic of the types of geothermal fluids that will be obtained from the young volcanic/young sediment formations of the northern intermountain west. About 12.5 acres



in southern Idaho were subdivided by crops and irrigation practices for investigation with the geothermal water and a control comparison water from the Raft River. The experiment addresses heavy metal uptake in plants, plant fluoride retention and damage, plant tolerances to salts, soil alterations and other behavior as a result of the geothermal fluids. First results indicate no apparent difference between the geothermal watered crops and those obtained using the fresh water control. ERA

**N77-32612#** Honeywell, Inc., St. Paul, Minn. Systems and Research Center

**NORTH VIEW JUNIOR HIGH SCHOOL SOLAR ENERGY DEMONSTRATION PROJECT Quarterly Progress Report, 1 Dec. 1974 - 28 Feb. 1975**

G. L. Merrill 10 Apr 1975 151 p

(Contract NSF C-870)

(PB-267447/1 NSF/RA/N-75-109) Avail NTIS HC A08/MF A01 CSCL 13A

The operation of a solar energy demonstration project during the winter in Minneapolis is reported. Snow accumulating on the collectors caused a marked drop in their efficiency. In spite of some melting, new accumulations eventually covered about 30% of the collectors. The operation of the system through this period of snow, cold weather, and some other mechanical problems was studied. Insolation, collected energy, efficiency, inlet temperature, outlet temperature, and ambient temperature were plotted for each day of operation during the months of December, January, and February. GRA

**N77-32613#** Radian Corp., Austin, Tex

**IN-SITU COAL GASIFICATION STATUS OF TECHNOLOGY AND ENVIRONMENT IMPACT Exhibit A Report, Oct 1976 - Feb. 1977**

Nancy P. Phillips and Charles A. Muela May 1977 184 p refs

(Contract EPA-68-02-2147)

(PB-268576/6, EPA-600/7-77-045) Avail NTIS HC A09/MF A01 CSCL 081

Results of a literature review and personal contacts to ascertain in-situ coal gasification and to collect existing environmental data are presented. A general description of the chemistry, technology, and technological problems, along with detailed descriptions of the technical objectives, approaches, and results of ongoing projects are reviewed. This presentation is used as a basis for summarizing the current state of knowledge regarding environmental issues. GRA

**N77-32614#** Drexel Univ., Philadelphia, Pa. Energy Sources and Systems Inst

**THERMODYNAMIC ANALYSIS OF AN OIL RECLAMATION PROCESS**

Kamlesh R. Jhavar, Elihu D. Grossman, Harry L. Brown, and Bernard B. Hamel Jan 1977 200 p refs

(Grant NSF GI-36598)

(PB-268524/6, EIR-77/1, NSF/RA-770068) Avail NTIS HC A09/MF A01 CSCL 07A

Quantitative methodology for characterizing the energy utilization efficiency of waste oil reclamation processes is provided. A simple, reasonably accurate approach was taken to predict the thermodynamic availability, enthalpy, and entropy of petroleum fractions, water, and stack gas. Thermodynamic analysis was based on an availability balance including a lost work term associated with each unit of equipment. Efficiency based on the ideal work of the process and the total process lost work was defined as a means to measure the energy utilization efficiency of the process. GRA

**N77-32615#** Esso Research Center, Abingdon (England)

**CHEMICALLY ACTIVE FLUID-BED PROCESS FOR SULPHUR REMOVAL DURING GASIFICATION OF HEAVY FUEL OIL PHASE 3 Progress Report, Jul. 1973 - Sep. 1975**

J. W. T. Craig, G. L. Johnes, Z. Kowszun, D. Lyon, and L. S. Malkin Sep 1976 607 p refs

(Contract EPA-68-02-1359)

(PB-268492/6, EPA-600/2-76-248) Avail NTIS HC A99/MF A01 CSCL 07A

The third phase of studies on the CFB process for desulfurization/gasification of heavy fuel oil in a bed of hot lime is described. Major conclusions relating to process performance and operability are: (1) water has a strongly adverse effect on desulfurizing efficiency, (2) good desulfurizing efficiencies are obtainable at very low stone replacement rates, (3) process performance can be expressed as a statistically derived equation, (4) a burnback burner is feasible for coke removal, (5) SO<sub>2</sub>/stone disposal by sulfation is not feasible, but deadburning looks promising, and (6) most trace elements are retained in the bed. GRA

**N77-32616#** Texas Univ., Austin. Center for Energy Studies. **ENERGY MANAGEMENT FOR TEXAS COMMERCE AND INDUSTRY**

Jerald Jones, Richard Bywaters, and Philip Schmidt 1976 169 p refs. Sponsored by the Texas Governor's Energy Advisory Council

(PB-268409/0) Avail NTIS MF A01 CSCL 10A

The need for energy planning is outlined. Basic ingredients of an energy management program are reviewed and energy conservation in buildings, industry and manufacturing is discussed. Management of energy resources is also included. GRA

**N77-32617#** Idaho Univ., Moscow. Coll. of Forestry and Engineering

**UNCONVENTIONAL ENERGY SOURCES Final Report**

Leonard R. Johnson 1977 278 p refs. Sponsored by Northwest Energy Policy Project

(PB-268301/9, NEPP-III-B) Avail NTIS HC A13/MF A01 CSCL 10A

Available literature and current state-of-the-art on unconventional energy sources are reviewed. Geothermal, biomass, ocean, wind, and solar energies are included. The report estimates quantities of energy available to the Pacific Northwest and the costs of recovering and utilizing energy from these sources. Projections of the contribution of unconventional sources to Northwest energy needs are summarized. An annotated bibliography is included. GRA

**N77-32618#** General Electric Co., Schenectady, N.Y.

**RESEARCH INTO THE IMPACT ON ELECTRICAL EQUIPMENT FROM VARIABLE SPEED OPERATION OF PUMPED-STORED PLANTS Final Report**

T. A. Lipo Apr 1977 182 p refs

(Contract DI-6-07-DR-50090)

(PB-268323/3, SRD-77-063) Avail NTIS HC A09/MF A01 CSCL 10C

The effect of operating electrical equipment of pumped-storage plants over a variable frequency range of 30 to 81 Hz was studied. The motivating factor behind the study was the desire to improve pumped-storage hydro efficiency. The electrical equipment considered included the generator/motor, excitation equipment, switchgear and bus, metering, surge protection, relaying, and power transformer. Converter harmonics and the converters' effect on system power factor were analyzed for the operator/motor. A simulation study was conducted on a hybrid computer to identify potential system problems which arise from variable speed operation. GRA

**N77-32619#** Energy Research and Development Administration, Washington, D.C.

**NATIONAL ENERGY PROJECTIONS AND PLANS OF THE USA**

1977 9 p. Presented at Intern. Conf. on Nucl. Power and its Fuel Cycles, Salzburg, Austria, 2-13 May 1976, sponsored by IAEA.

(IAEA-CN-36/397, Conf-770505-331) Avail NTIS HC A02/MF A01

The development and evolution of the ERDA's National Plan for Energy Research, Development, and Demonstration is reviewed and basic goals and strategies are discussed. U.S. energy projections to the end of this century are estimated and ways of meeting them are assessed. Options are then considered for the introduction of new technologies designed to lessen the nation's 75 per cent dependence on oil and gas fuels while

simultaneously creating alternative energy choices for the future. The plan singles out energy efficiency technologies for increased attention, identifies the major near and midterm supply technologies, outlines initial program steps to overcome technological barriers to the large-scale implementation of these technologies, and reviews longer-range energy programs and prospects. ERA

**N77-32638#** Pacific Environmental Services Inc., Santa Monica, Calif

**STUDY OF GASOLINE VAPOR EMISSION CONTROLS AT SMALL BULK PLANTS Final Report**

R J Bryan, W O Jacobson, R R Saakida, and P S Bakshi  
Oct 1976 288 p refs

(Contract EPA-68-01-3156)

(PB-267096/6) Avail NTIS HC A13/MF A01 CSCL 21D

An independent evaluation of the impact of hydrocarbon emission controls on bulk plants was conducted. A data base from a survey of bulk plants in three Air Quality Control Regions was developed. The data base was used to define a typical bulk plant operation and estimate the uncontrolled hydrocarbon emissions. Results indicate that the typical bulk plant is small (15,000 liters per day) and that breathing and fugitive emissions are significant factors in addition to transfer emissions. Available hydrocarbon emission control techniques were surveyed for cost, efficiency, development status and bulk plant applicability. GRA

**N77-32681#** Peat, Marwick, Mitchell and Co., Anchorage, Alaska  
**ALASKA OCS SOCIOECONOMIC STUDIES PROGRAM. LITERATURE SURVEY**

Apr 1977 495 p refs Prepared in cooperation with Dames and Moore Anchorage Alaska

(Contract DI-AA550-CT6-61)

(PB-269244/0, BLM/SE-77-04) Avail NTIS  
HC A21/MF A01 CSCL 081

The Literature Survey is the second of six reports comprising the first year of the Alaska OCS Socioeconomic Studies Program, and establishes the basic information context for the project's other components. The literature reviewed has a broad relevance to OCS development in Alaska and four petroleum development regions: the Beaufort Sea region, Bering Sea region, Southwest region, and the Gulf of Alaska region. Sixteen chapters discuss the most relevant literature, current research and data gaps. Each subject chapter includes a bibliography listing cited literature. GRA

**N77-32888#** Argonne National Lab., Ill  
**COST ESTIMATION FOR A THETA-PINCH REACTOR**

T A Coultas, J M Cook, P Crnkovich, and P Dauzvardis  
Feb 1976 28 p refs Presented at the 6th IEEE Symp on Eng problems of Fusion Res., San Diego, Calif., 18-21 Nov 1975 (Contract W-31-109-eng-38)

(ANL/CTR-TM-40, Conf-751125-149) Avail NTIS  
HC A03/MF A01

A simulation of a theta-pinch fusion power plant has been completed to the point where economic feasibility can be examined. A cost subprogram is presented for interfacing with a computer code. This code is then used to obtain a first approximation of the costs for the reactor. Independent geometrical and plant design parameters are varied over a wide range with simultaneous variation of magnetic field, minor first wall radius, and plasma maximum compression. The study indicates that the plant energy balance must be favorable, availability must be high, and major component costs must be low to achieve economical results. Although costing uncertainties remain, it is clear that development of easy and rapid replacement methods for reactor components is essential and that new staging concepts to reduce the implosion energy requirements must be pursued. ERA

**N77-32893#** Battelle Pacific Northwest Labs., Richland, Wash  
**ENVIRONMENTAL COST/BENEFIT ANALYSIS FOR FUSION POWER PLANTS**

J R Young Nov 1976 73 p refs

(Contract EY-76-C-06-1830)

(BNWL-2028) Avail NTIS HC A04/MF A01

A cost/benefit analysis of use of fusion power plants early in the 21st century is presented. The first section describes the general formulation of the analysis. Included are the selection of the alternatives to the fusion reactor, selection of the power system cases to be compared, and a general comparison of the environmental effects of the selected alternatives. The second section compares the cumulative environmental effects from 2010 to 2040 for the primary cases of the power system with and without fusion reactors. The third section briefly illustrates the potential economic benefits if fusion reactors produce electricity at a lower unit cost than LMFBRs can. The fourth section summarizes the cost/benefit analysis. ERA

**N77-32894#** Battelle Pacific Northwest Labs., Richland, Wash  
**CURRENT FUSION POWER PLANT DESIGN CONCEPTS**

B F Gore and E S Murphy Sep 1976 177 p refs

(Contract EY-76-C-06-1830)

(BNWL-2013) Avail NTIS HC A09/MF A01

Current U.S. designs for fusion power plants were used to define an envelope of fusion power plant characteristics which formed the basis for definition of reference first commercial fusion power plant design. Primary plant features are described and tabulated. These tables summarized in side-by-side fashion, plant parameters, processes, combinations of materials used, requirements for construction materials, requirements for replacement materials during operation, and production of wastes. ERA

**N77-32895#** Energy Research and Development Administration, Washington, D C  
**ROLE OF FUSION AS A FUTURE POWER SOURCE**

E E Kintner 1977 18 p refs Presented at Intern Conf on Nucl Power and its Fuel Cycles, Salzburg (Austria) 2 May 1977

(IAEA-CN-36/428, Conf-770505-1) Avail NTIS  
HC A02/MF A01

International cooperation in the development of fusion power as an inexhaustible energy source that is safe, economical, and with acceptable environmental effects is considered. Specific topics discussed include: (1) magnetic fusion power, (2) plasma physics, (3) laser and electron beam fusion, and (4) alternative fusion devices and the Tokamak configuration. Emphasis is placed on the United States programs. J M S

**N77-32910#** Royal Inst of Tech., Stockholm (Sweden) Dept of Plasma Physics and Fusion Research

**POWER LOSS PROBLEMS IN EXTRAP COIL SYSTEMS Research and Training Programme on Controlled Thermonuclear Fusion and Plasma Physics (EUR-NE)**

B Lehnert Feb 1977 17 p refs Sponsored by EURATOM (TRITA-PFU-77-02) Avail NTIS HC A02/MF A01

The ohmic power loss in the coils of external ring traps is minimized with respect to the thermonuclear power production. In the case of the DT-reaction this leads to dimensions and power densities being relevant to full-scale reactors. Not only superconducting or refrigerated coil windings can thus be used, but also hot-coil systems which are operated at several hundred C and form part of a steam cycle and power extraction system. For hot coils the problems of void formation and tritium regeneration have to be further examined. The high beta value leads to moderately large coil stresses. Finally, replacement and repair become simplified by the present coil geometry. Author (ESA)

**N77-32914#** Commission of the European Communities, Brussels (Belgium)

**JET PROJECT (DESIGN PROPOSAL)**

Mar 1976 615 p Revised

(EUR-5516) Avail NTIS (US Sales Only), HC A99/MF A01, ERDA Depository Libraries

A large Tokamak experiment, which aims to study plasma behavior in conditions and dimensions approaching those required

in a fusion reactor is described. The maximum plasma minor radius is 1.25m and the major radius is 2.96m. An important feature is the flexibility to study, for plasma currents in the 1 yields 3MA range, a wide range of aspect ratios toroidal magnetic fields, minor radii, and elongation ratios. The design proposal provides an introduction to the field of fusion research and relates JET to European and international programs. The objectives of research with JET, and the apparatus are discussed as well as the cost and construction schedules, the proposed experimental program and the possible modes of operation of the device. A detailed account of the engineering design and the staff and cost estimates is included. ERA

**N77-32958#** Battelle Pacific Northwest Labs., Richland, Wash.  
**PROJECTED THERMODYNAMIC EFFICIENCIES OF FUSION POWER PLANTS**

M. A. McKinnon. Sep 1976. 15 p. refs.  
 (Contract EY-76-C-06-1830)

(BNWL-2017). Avail. NTIS HC A02/MF A01

Estimated thermal efficiencies of proposed fusion power plant concepts are compared to the efficiencies of nonfusion power plants. Present trends in electrical power generation are also discussed. The fusion reactor system designs have the same thermal efficiencies as power plants using steam if these designs require the collection of thermal energy at the blanket and the transfer of that energy to a heat exchanger or boiler using the current technology. Methods should be developed for increasing the temperatures of the reactor coolants since the maximum attainable thermal efficiency of systems using coolants can be increased only by increasing the coolant temperatures. Advanced power recovery systems such as potassium topping turbines, MHD, and direct conversion should be developed since such systems avoid the limits on steam systems due to excessive operating pressures at high temperatures. ERA

**N77-32955** Stanford Univ., Calif.  
**HEAT TREATMENT OF REFUSE FOR INCREASING ANAEROBIC BIODEGRADABILITY** Ph.D. Thesis

James Michael Gossett. 1977. 222 p.

Avail. Univ. Microfilms. Order No. 77-12640

Heat-treatment methods for altering the normal association of lignin with cellulose in municipal refuse were investigated with the aim of improving anaerobic digestibility. Increases in biodegradability were determined by a rapid bioassay procedure using a Warburg respirometer to measure increases in gas production by an anaerobic methane-producing mixed culture. The maximum increase in biodegradability was found near pH 13, where the biodegradability of the previously-digested material was doubled after treatment for one hour at 200°C. A simple model is presented which somewhat successfully predicts resulting biodegradabilities using the biodegradability of the untreated material and the measured or estimated chemical compositions of treated and untreated samples as inputs. A key assumption of the model is that the biodegradability of remaining solid-phase carbohydrate is a linear function of the extent of delignification.

Dissert. Abstr.

**N77-33154#** RAND Corp., Santa Monica, Calif.  
**AN EVALUATION OF VERY LARGE AIRPLANES AND ALTERNATIVE FUELS: EXECUTIVE SUMMARY** Interim Report

W. T. Mikolowsky. Dec 1976. 41 p. refs.  
 (Contract F49620-77-C-0023)

(AD-A042112, R-1889/1-AF). Avail. NTIS HC A03/MF A01 CSCL 21/4

Candidate applications of very large airplanes include strategic airlifter, tanker, missile launcher, tactical battle platform, maritime air cruiser, and C3 platform. This report summarizes AD-A040532 which explored the military utility of very large airplanes (over 1 million pounds gross weight) and examined several alternative fuels that could be used by such airplanes.

GRA

**N77-33255\*#** Martin Marietta Corp., Denver, Colo.  
**TECHNOLOGY REQUIREMENTS FOR ADVANCED EARTH-ORBITAL TRANSPORTATION SYSTEMS: SUMMARY REPORT** Final Report

Rudolph C. Haefeli, Ernest G. Littler, John B. Hurley, and Martin G. Winter. Washington: NASA, Oct 1977. 62 p.  
 (Contract NAS1-13916)

(NASA-CR-2867). Avail. NTIS HC A04/MF A01 CSCL 22B

Areas of advanced technology that are either critical or offer significant benefits to the development of future Earth-orbit transportation systems were identified. Technology assessment was based on the application of these technologies to fully reusable, single-state-to-orbit (SSTO) vehicle concepts with horizontal landing capability. Study guidelines included mission requirements similar to space shuttle, an operational capability beginning in 1995, and main propulsion to be advanced hydrogen-fueled rocket engines. The technical and economic feasibility of this class of SSTO concepts were evaluated as well as the comparative features of three operational take-off modes, which were vertical boost, horizontal sled launch, and horizontal take-off with subsequent in-flight fueling. Projections of both normal and accelerated technology growth were made. Figures of merit were derived to provide relative rankings of technology areas. The influence of selected accelerated areas on vehicle design and program costs was analyzed by developing near-optimum point designs. Author

**N77-33347\*#** Springborn Labs., Inc., Enfield, Conn.  
**INVESTIGATION OF TEST METHODS, MATERIAL PROPERTIES AND PROCESSES FOR SOLAR CELL ENCAPSULANTS** Annual Report

P. B. Willis and B. Baum. Jul 1977. 164 p. Sponsored in part by ERDA. Prepared for JPL.  
 (Contracts NAS7-100, JPL-954527)

(NASA-CR-155158, ERDA/JPL-954527-77/2). Avail. NTIS HC A08/MF A01 CSCL 11C

The potentially useful encapsulating materials for Task 3 of the Low-Cost Silicon Solar Array project were studied to identify, evaluate, and recommend encapsulant materials and processes for the production of cost-effective, long-life solar cell modules. Materials for study were chosen on the basis of existing knowledge of generic chemical types having high resistance to environmental weathering. The materials varied from rubbers to thermoplastics and presented a broad range of mechanical properties and processing requirements. Basic physical and optical properties were measured on the polymers and were redetermined after exposure to indoor artificial accelerated aging conditions covering four time periods. Strengths and weaknesses of the various materials were revealed and data was accumulated for the development of predictive methodologies. To date, silicone rubbers, fluorocarbons, and acrylic polymers appear to have the most promising combination of characteristics. The fluorocarbons may be used only as films, however, because of their high cost.

Author

**N77-33370#** National Bureau of Standards, Washington, D. C.  
**ESTIMATION OF NET ENTHALPIES OF COMBUSTION OF SOME AVIATION FUELS EXPRESSED IN THE INTERNATIONAL SYSTEM OF UNITS (SI)** Final Report

Ralph L. Nuttall and George T. Armstrong. Apr 1977. 64 p. refs.  
 (NBS-TN-937). Avail. SOD HC \$1.30 as Ep46 937

Correlating equations, using SI units, which are linear in each of the variables, (1) aniline point in deg. C, (2) reciprocal density in grams per cubic centimeter, and (3) sulfur mass percent, are presented for five classes of aviation fuels. These equations fit the observed values at least as well as the previous aniline point-gravity product equations. An equation which is quadratic in aniline point and reciprocal density was found to fit all the data with a standard deviation of 25.4 Btu/lb = 0.05904 MJ/kg. This equation can be used to predict the net heat of combustion of the fuels considered to within 50 Btu/lb or 0.11808 MJ/kg at a 95 percent confidence level. Author

**N77-33372#** Acurex Corp., Mountain View, Calif Aerotherm Div

**ALTERNATE PETROLEUM BASED FUELS FOR NAVAL FLEET USAGE: POTENTIAL AVAILABILITY, COST, AND SYSTEM IMPACT**

L M Cohen, G R Offen, and L M Schalit Jun 1977 147 p refs

(Contract N00014-76-C-0707)

(AD-A041980 Aerotherm-FR-77-247) Avail NTIS HC A07/MF A01 CSCL 21/4

In recent years, particularly since the Oil Embargo of 1973, all major fuel consuming sectors in the United States Navy have become increasingly aware of the limited supply and high cost of petroleum fuels. Fuel is currently consumed by the Navy at the rate of 230,000 barrels per day. Energy conservation is one method to reduce this demand on petroleum resources and the resulting high annual expenditures for fuel. In addition, conservation is in the long-term interests of the country, since it assists nationwide efforts to stretch our remaining oil reserves. Alternatives to petroleum-based fuels are another option. One of these, shale oil, is being evaluated by the Navy in their 100,000 barrel oil shale experiment. Yet another option could be the use of fuels which do not meet all the requirements of military specifications (MILSPECs) for fuels, but which could be burned without significantly impairing naval operations. This approach could increase fuel availability and reduce costs to the Navy. To assess the feasibility of using non-MILSPEC fuels in Navy combustion equipment, the David W Taylor Naval Ship Research and Development Center engaged the Aerotherm Division of Acurex Corporation to perform a study with the following objectives: (1) determine whether there exists a large supply of fuel beyond that currently being procured for the Navy which meets or nearly meets, military specifications, (2) determine whether any such comparable 'nonspec' fuel is less expensive than the currently approved product, and (3) assess, using all available information, the viability of storing, handling, and burning comparable 'nonspec' fuels in naval systems, even if only on a limited basis. GRA

**N77-33374#** Texaco, Inc., Montebello, Calif Research Lab  
**HYDROGEN PRODUCTION FROM COAL LIQUEFACTION RESIDUES Final Report**

Allen M Robin Dec 1976 71 p  
(EPRI Proj 714-1)

(EPRI-AF-233) Avail NTIS HC A05/MF A01

High ash H-coal residues from the liquefaction of coals were gasified in a synthesis gas generator. The synthesis gas produced consisted of over 92 percent volume carbon monoxide and hydrogen on a dry basis. Approximately 40 tons of each residue was gasified at 24 atmospheres pressure at residue feed rates up to 1/2 ton per hour. No major operating problems were experienced. Cold gas efficiencies averaged between 83 and 84 percent. Steam and oxygen requirements were comparable to those of heavy oil gasification. Enough data were obtained to verify existing computer correlations and establish information needed to provide a commercial plant design for these two, and other similar, coal liquefaction residues. ERA

**N77-33377#** Bonner and Moore Associates, Inc., Houston, Tex  
**OVERVIEW AND REVIEW OF MOTOR GASOLINE DESULFURIZATION, VOLUME 1**

Dec 1976 80 p refs

(Contract EY-76-C-02-0041)

(BERC/RI-76/17-Vol-1) Avail NTIS HC A05/MF A01

The general technology for desulfurizing motor gasoline is described and prior studies reviewed. The removal of additional sulfur from motor gasoline may be required because catalytic converters on 1975 and later model cars may convert the sulfur into potentially environmentally undesirable compounds, sulfuric acid mist and sulfate particles, when the exhaust passes through the catalytic converter. While other methods of solving this environmental issue are available, only the removal of additional sulfur from gasoline is considered. ERA

**N77-33378#** Bonner and Moore Associates, Inc., Houston, Tex  
**MOTOR GASOLINE DESULFURIZATION STUDY, VOLUME 2**

Dec 1976 164 p

(Contract EY-76-C-02-0041)

(BERC/RI-76/17-Vol-2) Avail NTIS HC A08/MF A01

For abstract, see N77-33377

**N77-33426#** Brookhaven National Lab., Upton, N Y Accelerator Dept

**POWER TRANSMISSION PROJECT Progress Report through FY 1976**

27 Dec 1976 273 p refs

(Contract EY-76-C-02-0016, Grant NSF AG-381, EPRI

Proj 78-441)

(BNL-22202) Avail NTIS HC A12/MF A01

A year's work on the development of helium cooled niobium tin superconducting cables for 550 kV or higher power transmission lines is summarized. Information is included on: (1) conductor research involving the fabrication, materials testing, and performance testing of Nb<sub>3</sub>Sn tapes; (2) design, materials testing and performance testing of cable insulation; (3) mechanical and cryogenic engineering of transmission line components and of test facilities; and (4) accumulated data on the design and testing of existing helium-cooled transmission lines in the Pennsylvania study. Author (ERA)

**N77-33430#** Westinghouse Electric Corp., Pittsburgh, Pa  
**ANALYSIS AND FORECAST OF ELECTRICAL DISTRIBUTION SYSTEM MATERIALS VOLUME 3 APPENDIX Final Report**

C G Love 23 Aug 1976 311 p refs

(Contract E(49-18)-2050)

(CONS/2050-1-Vol-3-App) Avail NTIS HC A14/MF A01

These appendixes contain the detailed electrical distribution equipment requirements and input material requirements forecasts. Forecasts are given for three electric energy usage scenarios. Also included are data on worldwide reserves and demand for 30 raw materials required for the manufacture of electrical distribution equipment. ERA

**N77-33464#** Selskapet for Industriell og Teknisk Forskning Trondheim (Norway) Div of Structural Engineering

**A FINITE ELEMENT MODEL FOR THE ANALYSIS OF WATERFLOOD PERFORMANCE**

Vilgeir Dalen 5 Nov 1975 62 p refs Sponsored by Norweg Council for Sci and Ind Res

(STF71-A75036, ISBN-82-595-0654-8) Avail NTIS

HC A04/MF A01

A mathematical model for waterflood performance is described and a numerical solution method is applied. This method is based on spatial discretization by the finite element formulation of the Galerkin method and a semi-implicit formulation in time. A computer program is briefly described and several example problems are solved. The various alternatives included in the formulation of the solution method are compared and guidance is given as to how the model is most efficiently applied. Author (ESA)

**N77-33479#** Shaker Research Corp., Ballston Lake, N Y  
**UNDERGROUND COAL MINE INSTRUMENTATION AND TEST Final Report**

R F Burchill and W D Waldron [1976] 129 p refs

(Contract NAS8-31668)

(NASA-CR-150045) Avail NTIS HC A07/MF A01 CSCL 14B

The need to evaluate mechanical performance of mine tools and to obtain test performance data from candidate systems dictate that an engineering data recording system be built. Because of the wide range of test parameters which would be evaluated, a general purpose data gathering system was designed and assembled to permit maximum versatility. A primary objective

of this program was to provide a specific operating evaluation of a longwall mining machine vibration response under normal operating conditions. A number of mines were visited and a candidate for test evaluation was selected, based upon management cooperation, machine suitability, and mine conditions. Actual mine testing took place in a West Virginia mine. Author

**N77-33512#** Stanford Research Inst., Menlo Park, Calif  
Molecular Physics Center  
**FIELD IONIZATION FOR LASER ISOTOPE SEPARATION**  
Final Report

T F Gallagher, R M Hill, and S A Edelstein Dec 1976  
70 p refs  
(EPRI Proj 506-3)  
(EPRI-NP-334) Avail NTIS HC A04/MF A01

Research into an aspect of the uranium fuel cycle, the separation of the fissionable U235 fuel from the more abundant, stable U238 is discussed. It was demonstrated by laboratory experiments that by using electric field ionization of atoms excited by lasers, the efficiency of atomic laser isotope separation can be improved a thousandfold over the direct photoionization method. Both atomic and molecular laser isotope separation processes are reviewed. Technical journal articles which further describe the work and its implications are provided. ERA

**N77-33519\*#** Jet Propulsion Lab., Calif Inst of Tech., Pasadena  
**COMPENDIUM OF CRITIQUES OF JPL REPORT SP-43-17: AUTOMOTIVE TECHNOLOGY STATUS AND PROJECTIONS PROJECT**

A Nash Williams 18 Jul 1977 644 p refs Sponsored by ERDA  
(Contract NAS7-100)  
(NASA-CR-155180 JPL-Pub-77-40) Avail NTIS  
HC A99/MF A01 CSCL 13F

Almost 50 critiques of the Jet Propulsion Laboratory report SP-43-17 are presented together with the JPL responses. Author

**N77-33596** Houston Univ. Tex  
**AN ECONOMIC MODEL OF NEW CRUDE OIL AND NATURAL GAS SUPPLIES IN THE LOWER 48 STATES**  
Ph D Thesis

Young Yuel Kim 1977 207 p  
Avail Univ Microfilms Order No 77-19565

An economic model is developed to show how reserve additions and economics of oil and gas will be affected by wellhead prices, tax provisions, finding rates, and drilling capacity availabilities. The range of reserve additions estimated by the model where government pricing and taxing policies are varied is much greater than the range of reserve additions estimated by the U S Geological Survey where government pricing and taxing policies are not varied. Results of the model show how supplies of crude oil and natural gas from new resources in the lower 48 states and Texas will be affected by different price relationships, tax provisions, finding rates, and time horizons. High priority in future research should be given to extending the economic analysis for the lower 48 states to include the Alaskan and Offshore areas. Dissert Abstr

**N77-33598** California Univ. Riverside  
**ENERGY IN AN OASIS: GEOTHERMAL RESOURCE DEVELOPMENT IN THE IMPERIAL VALLEY OF CALIFORNIA**  
Ph D Thesis

Martin Joseph Pasqualetti 1975 422 p  
Avail Univ Microfilms Order No 77-20330

Attention is given to the Imperial Valley, best known as an agricultural oasis. It is a large hot water geothermal resource as well. The difficulties of developing such a resource within a totally artificial yet highly profitable environment are discussed. Most obstacles to geothermal development are related to protection of the agricultural economy. The main concerns are for subsidence, induced seismicity, water supply blowouts, the effect of air pollution on crops, and the possible socioeconomic

changes in an established way of life. The Imperial Valley offers an abundant labor pool, huge nearby markets, transportation networks, a snow free climate, and energy which together constitute most of the important considerations in industrial location. Dissert Abstr

**N77-33599#** Committee on Energy and Natural Resources  
(U S Senate)

**THE PRESIDENT'S ENERGY PROGRAM**

Washington GPO 1977 176 p refs. Compilation of documents for Comm on Energy and Natural Resources  
(GPO-88-556, Publ-9516)

Documents presented include the President's address to the Nation on the energy problem, his speech on the National Energy Program before the joint session of Congress, the fact sheet on the President's program, the transcript of his news conference, and the text of the National Energy Plan. A R H

**N77-33600\*#** National Aeronautics and Space Administration  
Lyndon B Johnson Space Center Houston Tex  
**SOLAR POWER SATELLITE CONCEPT EVALUATION ACTIVITIES REPORT VOLUME 2 DETAILED REPORT**  
Progress Report, Jul 1976 - Jun 1977

Jun 1977 1166 p refs  
(NASA-TM-74942, JSC-12973-Vol-2) Avail NTIS  
HC A99/MF A01 CSCL 10A

Comparative data are presented among various design approaches to thermal engine and photovoltaic SPS (Solar Power System) concepts to provide criteria for selecting the most promising systems for more detailed definition. The major areas of the SPS system to be examined include solar cells, microwave power transmission, transportation, structure, rectenna, energy payback, resources, and environmental issues. Author

**N77-33601\*#** Boeing Aerospace Co., Seattle Wash Electric Power Technology Div

**REVIEW OF ELECTROCHEMICAL IMPREGNATION FOR NICKEL CADMIUM CELLS**

Sidney Gross Aug 1977 116 p refs Prepared for JPL  
(Contracts NAS7-100, JPL-953984)  
(NASA-CR-155155) Avail NTIS HC A06/MF A01 CSCL 10A

A method of loading active material within the electrodes of nickel cadmium cells is examined. The basic process of electrochemical impregnation of these electrodes is detailed, citing the principle that when current is applied, reactions occur which remove hydrogen ions from solution, making the interior of the plaque less acidic. Electrodes result which are superior in energy density, stability, and life. The technology is reviewed and illustrated with typical performance data. Recommendations are made for additional research and development. Author

**N77-33603\*#** RCA Advanced Technology Labs., Camden N J  
Government Systems Div

**DESIGN DEFINITION OF A MECHANICAL CAPACITOR**  
Final Report, Jun 1976 - Apr 1977

T D Michaelis, E W Schlieban, and R D Scott May 1977  
292 p refs  
(Contract NAS5-23650)  
(NASA-CR-152613) Avail NTIS HC A13/MF A01 CSCL 10B

A design study and analyses of a 10 kW-hr, 15 kW mechanical capacitor system were studied. It was determined that magnetically supported wheels constructed of advanced composites have the potential for high energy density and high power density. Structural concepts are analyzed that yield the highest energy density of any structural design yet reported. Particular attention was paid to the problem of friction caused by magnetic and I to the second power R losses in the suspension and motor-generator subsystems, and low design friction levels have been achieved. The potentially long shelf life of this system and the absence of wearing parts, provide superior performance over conventional flywheels supported with mechanical bearings. Costs and economies of energy storage wheels were reviewed briefly. Author

**N77-33604\*** Jet Propulsion Lab Calif Inst of Tech Pasadena  
Control and Energy Conversion Div  
**ELECTRICAL 2-OMEGA-cm 0.046-cm-THICK SILICON  
SOLAR CELLS AS A FUNCTION OF INTENSITY AND  
TEMPERATURE**

P A Berman, T F Miyahara and B E Anstaugh 15 Aug  
1977 37 p Revised  
(Contract NAS7-100)

(NASA-CR-155166, JPL-Pub-77-27-Rev-1) Avail NTIS  
HC A03/MF A01 CSCL 10A

Electrical characteristics of Mariner 71 type silicon solar  
cells are presented in graphical and tabular format as a function  
of intensity and temperature Author

**N77-33605\*** General Electric Co Wilmington Mass Aircraft  
Equipment Div

**SOLID POLYMER ELECTROLYTE (SPE) FUEL CELL TECH-  
NOLOGY PROGRAM, PHASE 1/1A Final Report**

17 Oct 1975 92 p  
(Contract NAS9-14345)

(NASA-CR-151506 TPR-015) Avail NTIS HC A05/MF A01  
CSCL 10A

A solid polymer electrolyte fuel cell was studied for the  
purpose of improving the characteristics of the technology Several  
facets were evaluated, namely (1) reduced fuel cell costs, (2)  
reduced fuel cell weight (3) improved fuel cell efficiency and  
(4) increased systems compatibility Demonstrated advances were  
incorporated into a full scale hardware design A single cell unit  
was fabricated A substantial degree of success was demon-  
strated Author

**N77-33606\*** General Electric Co, Wilmington Mass Aircraft  
Equipment Div

**SOLID POLYMER ELECTROLYTE (SPE) FUEL CELL TECH-  
NOLOGY PROGRAM, PHASE 2/2A Final Report**

15 Dec 1976 96 p  
(Contract NAS9-14345)

(NASA-CR-151507, TPR-028-4) Avail NTIS  
HC A05/MF A01 CSCL 10A

Test evaluations were performed on a fabricated single solid  
polymer electrolyte cell unit The cell operated at increased current  
density and at higher performance levels This improved  
performance was obtained through a combination of increased  
temperature, increased reactant pressures improved activation  
techniques and improved thermal control over the baseline cell  
configuration The cell demonstrated a higher acid content  
membrane which resulted in increased performance Reduced  
catalyst loading and low cost membrane development showed  
encouraging results Author

**N77-33608\*** Exxon Research and Engineering Co Linden  
N J Government Research Labs

**REDOX BULK ENERGY STORAGE SYSTEM STUDY,  
VOLUME 1 Final Report, 18 Feb. 1976 - 30 Jan 1977**

G Ciprios W Erskine Jr and P G Grimes 10 Feb 1977  
200 p refs 2 Vol

(Contract NAS3-19776)

(NASA-CR-135206-Vol-1 EXXON/GRU 1BH-77-Vol-1) Avail  
NTIS HC A09/MF A01 CSCL 10B

Opportunities were found for electrochemical energy storage  
devices in the U S electric utility industry Application require-  
ments for these devices were defined including techno-economic  
factors A new device the Redox storage battery was analyzed  
The Redox battery features a decoupling of energy storage and  
power conversion functions General computer methods were  
developed to simulate Redox system operations These studies  
showed that the Redox system is potentially attractive if certain  
performance goals can be achieved Pathways for reducing the  
cost of the Redox system were identified Author

**N77-33609\*** Exxon Research and Engineering Co Linden  
N J Government Research Labs

**REDOX BULK ENERGY STORAGE SYSTEM STUDY,  
VOLUME 2 Final Report, 18 Feb 1976 - 30 Jan 1977**

G Ciprios W Erskine Jr and P G Grimes 10 Feb 1977  
549 p refs

(Contract NAS3-19776)

(NASA-CR-135206-Vol-2 EXXON/GRU 2BH 77-Vol-2) Avail  
NTIS HC A23/MF A01 CSCL 10B

For abstract, see N77-33608

**N77-33610#** RAND Corp Santa Monica Calif  
**EUROPE'S CHANGING ENERGY RELATIONS**

Horst Mendershausen Dec 1976 121 p refs  
(Contract DAHC15-67-C-0158)

(R-2086-ISA) Avail NTIS HC A06/MF A01

In considering Western Europe's changing energy relations,  
the present study (1) projects likely changes during the decade  
ahead in the energy structures of OECD-Europe and for  
comparison the United States (2) examines current developments  
now under way in the oil natural gas coal, and nuclear energy  
situations of the principal Western European countries and (3)  
discusses international political economic and security issues  
related to these developments and to possible emergency  
disruptions of international oil supply Author

**N77-33612#** Air Force Aero Propulsion Lab, Wright-Patterson  
AFB, Ohio

**INVESTIGATION OF GaAs SOLAR CELL POTENTIAL  
PERFORMANCE AND COST Final Report, Jun. 1975 - Dec.  
1976**

Cecil Stuerke Feb 1977 23 p refs

(AD-A040738, AFAPL-TR-76-100)

Avail NTIS

HC A02/MF A01 CSCL 10/2

This report describes the results of a study which investigated  
GaAs solar cell potential performance and cost The study included  
a literature survey, analyses of cell performance, cost and  
weapon hardness, and limited cell testing From the completed  
study came an Air Force interpretation of the present development  
of GaAs solar cells and an assessment of their potential  
performance and cost GRA

**N77-33613#** Xerox Electro-Optical Systems, Pasadena, Calif  
**THERMAL ENERGY STORAGE DEMONSTRATION UNIT  
FOR VUILLEUMIER CRYOGENIC COOLER Interim Report,  
2 Jun. 1975 - 31 Aug. 1976**

Robert Richter Feb 1977 157 p

(Contract F33615-75-C-2045)

(AD-A040895, Rept-2340-I-1, AFAPL-TR-76-110) Avail NTIS  
HC A08/MF A01 CSCL 10/2

This report covers the work performed under the Thermal  
Energy Storage Demonstration Unit Program The report presents  
the analysis, design, fabrication, and testing of a thermal energy  
storage demonstration unit which was to be mated to an existing  
Vuilleumier cooler (AFJLR) to demonstrate the concept of powering  
such a device directly with stored thermal energy The Thermal  
Energy Storage Demonstration Unit was to be sized for delivering  
1000 watts thermal power for one hour at a temperature of  
1250 + or - 25 F The ternary eutectic 64 MgF2 - 30 LiF-6  
KF, which has a eutectic temperature of 1310F, was selected  
as the thermal energy storage material The report presents the  
approach and the assumptions underlying the design of the unit  
which incorporates a heat pipe for the transfer of energy from  
the thermal energy storage material to the hot cylinder of the  
Vuilleumier cooler Details of the fabrication and the testing of  
the Thermal Energy Storage Demonstration Unit are presented  
The analysis of the test data led to the conclusion that the  
basic design satisfied all requirements that were established for  
a TES unit The thermal energy storage material, however, was  
found to apparently release its latent heat of fusion over a wider  
temperature range than had been anticipated This fact can be  
attributed to nonisothermal phase transformation or a bulk  
thermal conductivity that is lower than had been assumed for  
the salt Author (GRA)

**N77-33614#** National Bureau of Standards, Washington, D C  
**AN APPROACH FOR MANAGING AN ENERGY CONSERVATION PROGRAM** Final Report, Dec 1975 - Jan. 1977

Jan 1977 61 p

(AD-A041086, NBSIR-77-1204, AFCEC-TR-77-11) Avail  
 NTIS HC A04/MF A01 CSCL 10/1

General and specific guidelines to be followed by USAF management personnel have been developed and tabulated in this report. These guidelines include, for example, establishing management structures to implement the detailed energy conservation programs, analyzing alternative energy conservation options for most of the Air Force Base facilities family housing units, and special buildings. The guidelines are to be helpful for establishing and implementing short- and long-range plans for energy management, gaining support of all Base and tenant personnel, and monitoring program progress. Author (GRA)

**N77-33615#** Bechtel Corp., San Francisco, Calif  
**COAL GASIFICATION STUDY** Final Report

Apr 1977 114 p refs

(Contract N68305-76-C-0009, ZF57571001)

(AD-A041860, EL-CR-77 013) Avail NTIS HC A06/MF A01  
 CSCL 21/4

The general problem of providing fuel gas for Navy base facilities is studied. The intent is first to provide designs of a coal gasification plant producing 6x 10 to the 9th power Btu/day reactor output, based on two types of reactors, second, to conduct parametric studies leading to means for the costing of similar plants operating on different feedstocks, and third, to provide a method for estimating the change in boiler rating which must follow the substitution of fuel gas for either oil or coal firing. The performance and economics given are based on conceptual design methods. The economic results allow comparison of fuel-gas and fuel-oil costs on the basis of the Navy's method of analyzing costs using the 'Economic Analysis Handbook,' NAVFAC P-442, 1975. The costs are the sum of all future outlays discounted to the present but allowing escalation at different rates for utilities and feedstock over a 25-year production period. Author (GRA)

**N77-33616#** National Bureau of Standards, Washington, D C  
**TRANSPIRATION HEAT TRANSFER IN THERMAL ENERGY STORAGE DEVICES**

B A Peavy and W E Dressler May 1977 32 p

(PB-267281/4, NBSIR-77-1237)

Avail NTIS

HC A03/MF A01 CSCL 13A

Sensible heat transfer that takes place in a thermal storage device composed of a porous material with a fluid transpiring through it was investigated. Experiments were performed on a prototype thermal storage device and results were compared to numerical values computed from an analytical model. GRA

**N77-33617#** Institute for Defense Analyses Arlington, Va  
 Science and technology Div  
**DoD ENERGY R AND D PART 2. MILITARY FUEL OPERATIONS PERFORMANCE AND R AND D IMPLICATIONS** Final Report, Apr 1975 - Sep. 1976

F R Riddell, R C Oliver and R E Reichenbach Mar 1977  
 104 p refs

(Contract DAHC15-73-C-0200)

(AD-A042272, P-1116-Pt-2) Avail NTIS HC A06/MF A01  
 CSCL 21/4

The questions addressed and the conclusions reached in this study are (1) What range of multifuel capability may be desirable in military engines to relieve possible fuel supply problems. The conclusion is that it would be advantageous for military aircraft to be able to use all types of jet fuels and for ground vehicles and ships to be able to use all types of diesel fuels as safeguards against short-term shortages of military specification fuels (2) What liquid hydrocarbon fuel options may be considered without incurring major performance degradation or severe maintenance problems. The conclusion is that with appropriate modifications to fuel supply and starting systems, the range of

fuels defined in (1) could be used. However, R and D is needed to determine exactly what modifications are required and how fuels may be field-tested. More R and D is also needed to assemble handbooks of information on operating envelope and maintenance changes that may result from use of off-specification fuels. Current information is far from complete. Fuels from syncrudes should be included in this R and D work (3) In the long-term, what alternatives to liquid hydrocarbon fuels can be considered. In the long-term (beyond 2000) the only possibilities appear to be (a) more extensive use of nuclear power in Navy ships and (b) use of liquid hydrogen in long-range aircraft. For all land and air tactical combat vehicles however, any change from liquid hydrocarbon fuels would involve major performance changes which are probably unacceptable. Author (GRA)

**N77-33618#** AIA Research Corp., Washington, D C  
**EARLY USE OF SOLAR ENERGY IN BUILDINGS A STUDY OF BARRIERS AND INCENTIVES TO THE WIDESPREAD USE OF SOLAR HEATING AND COOLING SYSTEMS**

Aug 1976 195 p

(Grant NSF APR-75-18339)

(PB-267832/4, NSF/RA-760578)

Avail NTIS

HC A09/MF A01 CSCL 13A

The principal findings, the methodology, and the results of a national survey of the early users of the technology are outlined. The results of life cycle cost analyses of fifteen selected solar heating projects as well as a general overview of the various economic factors relating to the commercialization of solar technology are presented. A regulatory analysis of sun rights and land use building codes, warranties of performance, rights to energy, and the implications of these rights are also described. GRA

**N77-33619#** Martin Marietta Corp., Baltimore Md  
**BIOLOGICAL SOLAR ENERGY CONVERSION APPROACHES TO OVERCOME YIELD, STABILITY AND PRODUCT LIMITATIONS** Progress Report, 1 Oct 1976 - 31 Mar 1977

Bessel Kok, C F Fowler, H H Hardt and R J Radmer Mar 1977 28 p refs

(Grant NSF AER-73-03291)

(PB-267937/1, MML-TR-77-27c, PR-4, NSF/RA-770063)

Avail NTIS HC A03/MF A01 CSCL 06A

The chloroplast aging and rate limitations in the photosynthetic electron transport system were studied. It was confirmed that the photosystem II acceptor, phenylenediamine, accepts electrons from two sites in the electron transport chain, one of which is uncoupler insensitive. These two sites have approximately equal rate constants and contribute about equally when photochemistry operates with maximum rates. Therefore, it was concluded that when uncoupler is present, the primary rate limitation precedes the uncoupler-insensitive transport to phenylenediamine. Fluorescence measurements have confirmed the results showing that chloroplast storage at high pH inhibits only the oxygen evolution system and not the functioning of the trap. GRA

**N77-33620#** New Mexico Univ., Albuquerque Dept of Economics

**SOLAR ENERGY POLICY AND PROSPECTS**

William D Schulze, Shaul Ben-David, Roberta Katson, Scott Noll, and Fred Roach Jul 1976 187 p

(Grant NSF APR-75-18249)

(PB-267986/8, NSF/RA-760577)

Avail NTIS

HC A09/MF A01 CSCL 13A

The economic feasibility of near-term solar energy sources, decontrolled energy prices for the United States on a state-by-state basis, near-term feasibility for solar residential space heating, for the full application of solar energy to a mixed load community in the Southwest, and application of solar process heat to industry are analyzed. GRA

**N77-33621#** Pennsylvania Dept of Community Affairs, Harrisburg

**RECLAMATION OF ENERGY FROM SOLID WASTE: THEORY AND PRACTICE A SELECTED, ANNOTATED BIBLIOGRAPHY FOR PENNSYLVANIA LOCAL GOVERNMENT OFFICIALS**

Nov 1976 33 p

(PB-267800/1) Avail NTIS HC A03/MF A01 CSCL 10A

Methods of reclaiming energy from solid waste are considered as possible solutions to community solid waste disposal problems  
GRA

**N77-33622#** Boeing Co Seattle, Wash

**ADVANCED THERMAL ENERGY STORAGE (TES) SYSTEMS Interim Summary Report**

Nov 1976 35 p refs

(Proj 788-1)

(EPRI-EM-256-SY) Avail NTIS HC A03/MF A01

Research in high temperature gas cooled central receivers for solar energy and for receiver conceptual design of energy storage systems compatible with higher temperature gas turbine systems was examined. The technical feasibility of high temperature thermal energy storage was studied in detail. The two advanced systems are a phase change energy storage with inorganic salts and a reversible thermochemical reaction energy storage system. A third system, a sensible heat pebble bed energy storage system was investigated as a near term benchmark. The phase change concept offers the most economic incentive primarily as a result of its high storage density. Major technical barriers involve storage media and container material compatibility testing. The thermo-chemical concept is the most attractive from a plant control flexibility standpoint. The major technical uncertainty is the required catalytic SO<sub>3</sub> dissociation reactor  
ERA

**N77-33624#** Naval Research Lab., Washington, D C

**GEOPHYSICAL FLUID DYNAMICS BACKGROUND FOR OCEAN THERMAL POWER PLANTS**

S A Piacsek, J Toomre, and G O Roberts (Science Applications Inc La Jolla, Calif) 1976 67 p refs

(Contract E(49-26)-1005)

(DSE/1005-1 NRL-GFD/OTEC-11-75)

Avail NTIS HC A04/MF A01

Background material and brief assessments in several areas of geophysical fluid dynamics (GFD) which bear directly on problems of the ocean thermal power plant operation are provided. Relevant GFD research areas discussed include turbulence and thermal wakes, ocean circulation and the permanent thermocline, air/sea interaction and thermocline variation, weather and climate modeling, and marine ecosystems. The relationships of each GFD area to specific ocean thermal power plant problems are illustrated and multiple disciplines in GFD that must be considered are emphasized  
ERA

**N77-33625#** Lamont-Doherty Geological Observatory, Palisades, N Y

**MARINE PASTURES: A BY-PRODUCT OF LARGE (100 MEGAWATT OR LARGER) FLOATING OCEAN-THERMAL POWER PLANTS Final Report**

S Laurence and O A Roels 31 Aug 1976 225 p

(Contract EY-76-S-02-2581)

(COO-2581-3) Avail NTIS HC A10/MF A01

The potential biological productivity of an open-sea mariculture system utilizing the deep-sea water discharged from an ocean-thermal energy conversion (OTEC) plant was investigated. In a series of land-based studies, surface water was used to inoculate deep water and the primary production of the resultant blooms was investigated. Each cubic meter of deep water can produce approximately 234 g of phytoplankton protein, and an OTEC plant discharge deep water at a rate of 45 x 10 to the fourth power cu m min to the -1 power could produce 53 x 10 to the seventh power kg of phytoplankton protein per 350-day year. A series of land-based shellfish studies indicated that, when fed at a constant rate of 183 x 10 to the 3 power g of protein per second per 70-140 g of whole wet weight, the clam, *Tapes japonica*, could

convert the phytoplankton protein-nitrogen into shellfish meat protein-nitrogen with an efficiency of about 33 per cent. Various factors affecting the feasibility of open-sea mariculture are discussed  
ERA

**N77-33626#** Franklin Inst Research Labs, Philadelphia, Pa  
**TECHNICAL AND ECONOMIC FEASIBILITY OF SOLAR AUGMENTATION FOR BOILER FEEDWATER HEATING IN STEAM-ELECTRIC POWER PLANTS**

Nov. 1976 94 p refs

(Contract EY-76-C-02-2864)

(COO-2864-1, F-C4362) Avail NTIS HC A05/MF A01

Results of a study on the technical and economic feasibility of augmenting heating of boiler feedwater in steam electric power plants by solar energy are presented. The possibility of retrofitting existing oil or gas fired steam plants with solar collection systems was investigated. The use of four solar collectors in connection with different methods of single degree of freedom sun following motions was examined. For all collectors, daily sun following without seasonal adjustment of tilt was found to be cost-effective. Conclusions indicate solar augmentation of boiler feedwater heating does not constitute a cost-effective method of fossil fuel conservation  
ERA

**N77-33628#** Maine Univ., Orono Coll of Engineering and Science

**PROCEEDINGS OF THE ERDA SEMI-ANNUAL SOLAR PHOTOVOLTAIC PROGRAM REVIEW MEETING**

1976 488 p Meeting held at Orono, Maine, 3-6 Aug 1976 (Contract E(49-18)-2477)

(CONF-760837-P2) Avail NTIS HC A21/MF A01

Separate abstracts were prepared for 28 papers presented on solar photovoltaic systems. Topics covered include conceptual design and systems analysis for solar photovoltaic systems, GaAs materials and devices, semiconductors, and polycrystalline silicon materials and devices. Also discussed were concentration systems and low cost silicon solar arrays  
ERA

**N77-33629#** Sandia Labs., Albuquerque, N Mex

**SANDIA LABORATORIES ENERGY PROGRAMS**

C D Lundergan, ed., P L Meady, ed., and R S Gillespie, ed  
Mar 1977 55 p

(Contract EY-76-C-04-0789)

(SAND-77-0034) Avail NTIS HC A04/MF A01

An overview is provided of energy programs being conducted in the development of economical and environmentally acceptable alternative energy sources. About 75 percent of the resources of this laboratory are applied to research and development for national security programs having to do primarily with nuclear weapons. The remaining 25 percent are applied to energy programs and energy-related activities, particularly those requiring resources that are also used in nuclear weapon and other national security programs. Examples of such energy programs and activities are research into nuclear fusion, protection of nuclear materials from theft or diversion, and the disposal of radioactive waste. Instruments developed to detect, measure, and record the detonation of nuclear devices underground are now being used to support the development of in-situ processing of coal and oil shale  
ERA

**N77-33630#** Energy Research and Development Administration, Washington, D C

**PUBLIC ACCEPTANCE OF NUCLEAR POWER**

James L Liverman 1977 18 p refs Presented at Intern Conf on Nucl Power and its Fuel Cycles, Salzburg (Austria)

(IAEA-CN-36/507, Conf-770505-79)

Avail NTIS HC A02/MF A01

A number of actions have been taken in the United States to prevent and to delay installation and development of nuclear technology. These actions are reviewed and analyzed with emphasis on the 1976 California nuclear moratorium referendum and other more recent actions at state and national levels. They are compared with the status and outcome of similar actions in other nations as is possible. Additionally, ERDA's current



approaches to public involvement in the decision making process is discussed, including the value of comprehensive analyses of health, environmental, and socioeconomic aspects of alternative energy sources in responding to public needs. U.S. plans for providing such analyses for all installed and developing energy technologies are presented with special reference to areas which require international cooperation for implementation. The value of international analysis and internationally accepted environmental control strategies for all energy technologies is also addressed. ERA

**N77-33631#** TRW Systems Group, McLean, Va  
**CONSUMER THERMAL ENERGY STORAGE COSTS FOR RESIDENTIAL HOT WATER, SPACE HEATING AND SPACE COOLING SYSTEMS**

30 Nov 1976 47 p refs

(Contract W-31-109-eng-38)

(ANL-K-76-3364-1) Avail NTIS HC A03/MF A01

The cost of household thermal energy storage (TES) in four utility service areas that are representative for hot water, space heating, and space cooling systems in the United States is presented. A technology characterization of commercially available and developmental/conceptual TES systems is given. Consumer cost of the three TES systems is then evaluated, based on typical designs in four utility service areas. ERA

**N77-33632#** ACE-Federal Reporters, Inc., Washington, D.C.  
**ENERGY TECHNOLOGIES FOR THE WEST: POSSIBLE EFFECTS OF ENERGY TECHNOLOGY ON LAND, WATER, AND AIR RESOURCES**

1976 81 p Workshop held at San Francisco, 21 Sep 1976

Sponsored by ERDA

(TID-27444) Avail NTIS HC A05/MF A01

By the year 2000, a water deficiency of about 2,250,000 acre-feet will exist in California; therefore, many agencies will not indefinitely commit supplies of fresh water for power plant cooling. Legislation for siting power plants along the coastline is summarized. A report is given on a program to investigate the energy required to develop water, or in short, to move water to where it is to be used, water which may be associated with the use and conservation of water, the energy associated with waste-water treatment, and waste-water reuse. The potential of geothermal resources is reviewed. It is believed the Lake County government can, with the state and Federal government, plan geothermal development. It is also believed the Geysers should be considered as a payoff area. An extensive question and answer session completed the workshop. ERA

**N77-33634#** Westinghouse Electric Corp., Pittsburgh, Pa  
**STUDY OF THE AUXILIARIES FOR LEAD-ACID BATTERY SYSTEMS FOR PEAKING POWER. Final Report, period ending Oct. 1976**

Dec 1976 274 p refs

(Contracts EX-76-C-01-2114, E(49-18)-2114)

(CONS/2114-3) Avail NTIS HC A12/MF A01

Areas addressed are hardware sharing with the power converter gear, system reliability, impact of cooling and ventilation systems, effects of system rating on auxiliaries costs, and the effects of advances of technology in monitoring and protection devices with the use of large-capacity cells. It was found that the most economic choice for a 10-MW, 40-MWh peaking power battery system using 5-kWh cells consists of a 1620 Vdc, 10-string design. The total cost per kW was found to be a steadily decreasing function of system rating; it was \$325/kW at a 10 MW rating. Water cooling of the battery is the most economic choice for virtually every climate. ERA

**N77-33635#** Yardney Electric Corp., Pawcatuck, Conn  
**DESIGN AND COST STUDY OF A ZINC/NICKEL OXIDE BATTERY FOR ELECTRIC VEHICLE PROPULSION. Final Report**

Oct 1976 118 p refs

(Contract W-31-109-eng-38)

(ANL-K-76-3543-1, Rept-2033-76)

Avail NTIS

HC A06/MF A01

A preliminary design and cost study of a zinc/nickel oxide battery suitable for electric vehicle propulsion was conducted. A state-of-technology four-cell zinc/nickel oxide battery module is specified having the following principal characteristics: Capacity (C/2 rate), 310 Ah, Voltage, 6.4 V, Total energy content (C/2 rate), 1.98 kWh, Weight, 26.4 kg, Specific energy (C/2 rate), 75 Wh/kg, Specific power (sustaining, peak), 68 W/kg, 250 W/kg, Cycle life (60 percent depth at C/2 rate), 500. Battery manufacturing processes and costs are defined for initial pilot production of the state-of-technology zinc/nickel oxide battery. Production of the advanced technology battery in a highly automated dedicated facility is then defined for plant capacity. Preliminary test procedures and standards for cells and batteries are defined including evaluation of basic performance, environmental effects and safety, by means of a comprehensive test matrix. ERA

**N77-33636#** United Technologies Research Center, East Hartford, Conn

**PRELIMINARY FEASIBILITY EVALUATION OF COMPRESSED AIR STORAGE POWER SYSTEMS, VOLUME 1. Final Report, Jun 1975 - Dec. 1976**

Dec 1976 318 p refs Sponsored in part by ERDA 2 Vol (Grant NSF AER-74-00242)

(CONS/NSF/42-1) Avail NTIS HC A14/MF A01

A preliminary technical, economic, and environmental feasibility evaluation of generating peak power with a compressed air power system incorporating a modified state-of-the-art gas turbine and an hydraulically compensated, mined, hard rock cavern was conducted. Results are presented covering the siting potential and economics for hard rock storage caverns, the types of aboveground equipment which could be used with suitable modifications, system performance and economics, and the potential for electric utility application. The technical approach was based on technology currently available, although in some cases not yet reduced to commercial practice. ERA

**N77-33637#** Atomics International, Canoga Park, Calif  
**SUBSEA NUCLEAR POWER GENERATING STATIONS FOR OFFSHORE OIL PRODUCTION OPERATIONS. PRELIMINARY SAFETY AND LICENSING INFORMATION DOCUMENT**

15 Feb 1977 48 p refs

(Contract EY-76-C-03-0701)

(AI-ERDA-13193) Avail NTIS HC A03/MF A01

Preliminary safety and licensing information is presented relating to the manufacture, installation, and operation of small subsea nuclear generating stations in remote offshore locations, and the associated onshore base-site activities of reactor refueling and system refurbishment at four-year intervals. The purpose of the proposed facilities is to provide a subsea power capability for offshore oil production operations in areas where surface conditions, water depths, or other environmental constraints may preclude the use of surface mounted power sources. This will provide the capability to achieve the maximum recovery of petroleum resources from the U.S. frontier areas. Summary descriptions of a typical subsea nuclear generating station and a typical base site-facility are presented. General safety and licensing considerations are discussed, and a representative schedule of licensing activities is outlined. ERA

**N77-33638#** Brookhaven National Lab., Upton, N.Y.  
**ROLE OF RENEWABLE ENERGY TECHNOLOGIES IN DEVELOPING COUNTRIES**

P.F. Palmedo 10 Jan 1977 11 p refs

(Contract EY-76-C-02-0016)

(BNL-22311) Avail NTIS HC A02/MF A01

Some of the implications of the choice between renewable, decentralized technologies and nonrenewable, centralized technologies as applied to developing countries are presented. In order to clarify the significance of the distinction between renewable and depletable resources, two qualifications are made. The resource and its feasible system to use that resource is of primary interest. The second qualification is that some resources that are finite have such large abundance that they can be considered

renewable Some specific steps that can be taken to give renewable energy resources an opportunity to compete on a more equal footing with conventional fossil and nuclear technologies are stimulate and support energy planning in developing countries, include appropriate technology in developed country R and D programs and develop and demonstrate technologies

ERA

**N77-33639#** California Univ., Livermore Lawrence Livermore Lab

# **US ENERGY FLOW IN 1976**

William J Ramsey 24 Mar 1977 8 p

(Contract W-7405-eng-48)

(UCID-17443) Avail NTIS HC A02/MF A01

An energy flow diagram for the U S for 1976 is presented, and one for 1975 is included for comparison. Some significant differences between 1975 and 1976 are total energy use increased 4.8 percent, almost reaching the record use of 1973, oil imports increased significantly to 155 quads, more than 20 percent above 1975, and almost 44 percent of our total oil use, coal and natural gas remained more or less constant, the industrial sector was unique in that its energy use decreased somewhat due to conservation efforts, delivered nuclear power increased by 10.9 percent and a trend toward electrification continued with distributed electrical energy increasing by 6.1 percent

ERA

**N77-33640#** California Univ., Berkeley Lawrence Berkeley Lab

# **ANALYSIS OF THE CALIFORNIA ENERGY INDUSTRY**

J Sathaye, H Ruderman, R Sextro, P Benenson, L Kunin, P Chan, J Kooser, Y Bendov, B Green, and R Clear Jan 1977 169 p refs

(Contract W-7405-eng-48)

(LBL-5928) Avail NTIS HC A08/MF A01

Energy policy is discussed in relation to the energy supply system for California, an integral part of the state's economy. Some of the questions to be addressed are if the energy system is to expand, by how much, and in what particular areas of supply, what are the policy ramifications of certain changes as opposed to others, and what are the major economic effects of changes in energy supply system plans. The California energy industry and its relationship to the California and U S economies is described. The analytic capability for determining the direct and indirect employment and income impacts resulting from a given energy future for California is provided. Methodology with scenarios that embody varying combinations of conventional energy technologies, new energy technologies and energy conservation measures is described and tested

ERA

**N77-33643#** Exxon Enterprises, Inc., New York

# **APPLICATION OF THE ALSTHOM/EXXON ALKALINE FUEL CELL SYSTEM TO UTILITY POWER GENERATION**

## **Final Report**

E R Elzinga, J G Bannochie, R J Bellows, J H Correa, H H Horowitz, and C W Snyder Jan 1977 247 p refs

(EPRI-EM-384) Avail NTIS HC A11/MF A01

An evaluation of Alsthom/Exxon alkaline fuel cell technology was made for application to utility power generation. It was determined how close the technology could come to EPRI efficiency, investment, and related targets. The program consisted primarily of a systems analysis to explore the effect of major variables such as fuel cell operating temperature, fuel type and degree of carbon oxides preremoval on efficiency and cost. Most of the effect centered around minimizing cost and heat rate by selecting the most appropriate process techniques and by heat integrating the various parts of the process

ERA

**N77-33644#** Oak Ridge National Lab, Tenn Energy Div

# **IMPROVED ENGINEERING-ECONOMIC MODEL OF RESIDENTIAL ENERGY USE**

Eric Hirst, Jane Cope, Steve Cohn, William Un, and Robert Hoskins

Apr 1977 68 p refs Sponsored in part by Federal Energy Admin

(Contract W-7405-eng-26)

(ORNL-CON-8) Avail NTIS HC A04/MF A01

An improved version of the ORNL residential energy use model was developed to simulate energy use in the residential sector from 1970 through 2000. The model provides considerable detail on annual energy uses by fuel, end use, and housing type, and also estimates annual equipment installations and ownership, equipment energy requirements, structural thermal integrities, fuel expenditures, equipment costs, and costs for improving thermal integrities on new and existing housing units. Thus, the model provides considerable detail on residential energy uses and associated costs. These details are useful for evaluating alternative energy conservation policies, programs and technologies for their energy and economic effects during the next quarter century

ERA

**N77-33645#** Michigan Technological Univ., Houghton

# **ENERGY AND PROTEIN PRODUCTION FROM PULP MILL WASTES**

Progress Report, 15 Sep. - 15 Dec. 1976

M F Jurgensen and J T Patton 15 Dec 1976 8 p refs

(Contract EY-76-S-02-2983)

(COO-2983-2) Avail NTIS HC A02/MF A01

Significant progress was made in establishing the operability and reliability of major pieces of equipment needed for the production of protein and methane from spent sulfite liquor (SSL). Batch ozonations of SSL were conducted at times varying from 1 to 6 hours at pH's in the range of 10 to 2. These screening experiments consistently indicate that low pH's favor the breakdown of SSL into organic fragments which are more easily assimilated by microorganisms. Approximately 23% of the organics oxidized at all pH levels indicated that pH has no effect on the total oxidation of SSL. Total sulfur content of SSL was not measurably altered by ozonation. The intense brown color of SSL was appreciably removed during ozonation. The contents of the reactor assumed a light brownish-yellow hue during the course of a 4 hour ozonation treatment

ERA

**N77-33646#** Los Alamos Scientific Lab., N Mex

# **ACCOUNTING SYSTEMS FOR ENERGY CONSERVATION**

R J Barrett and M Becker Nov 1976 10 p refs

(Contract W-7405-eng-36)

(LA-6569-MS) Avail NTIS HC A02/MF A01

It was found that existing methods of accounting for energy consumption are not well suited to the analysis of energy conservation programs. A thorough discussion is presented of what the characteristics of an energy conservation data base ought to be. A data base (GADFLY) is suggested, which would be designed for analysis of conservation policies. Using New Mexico as an example, the difference between GADFLY and the Federal Energy Administration's STRAWMAN data base is detailed

ERA

**N77-33648#** Energy Research and Development Administration, Washington, D C

# **PROGRAM PLAN FOR ERDA'S PARTICIPATION IN THE IEA WORKING PARTY ON ENERGY CONSERVATION RESEARCH AND DEVELOPMENT**

Feb 1977 118 p

(ERDA-77-57) Avail NTIS HC A06/MF A01

The Fiscal Year 1977 program plan for ERDA's participation in the Working Party on Energy Conservation research and development is presented. The purposes of this program plan are to (1) provide guidelines for United States participation in the Working-Party program for use by ERDA and other Federal agencies interested in cosponsoring research and development activities, (2) identify the Working-Party project areas in which ERDA and other Federal agencies are presently participating, specifying financial commitments, and (3) identify the Working-Party project areas in which ERDA and other Federal agencies are planning to participate, specifying financial commitments. The plan outlines specific goals and criteria for United States participation in the Working Party, and presents the current and planned participation of ERDA and other Federal agencies

ERA

**N77-33649#** Argonne National Lab., Ill

# **STRATEGIES FOR COMMERCIALIZING CUSTOMER THERMAL-ENERGY STORAGE**

**N77-33650**

S H Nelson Dec 1976 80 p refs  
(Contract W-31-109-eng-38)  
(ANL-ES-55) Avail NTIS HC A05/MF A01

Strategies for commercializing customer thermal storage are presented. Storage techniques evaluated are space heating, air conditioning, hot water heating, and interruptible hot water heating. Storage systems involved store off peak electric energy for thermal applications during peak load hours. Analyses of both storage techniques and principal parties affected by storage indicate four barriers: the absence of commercially available air conditioning storage devices, appropriate rates, information on both rates and devices, and widespread utility support. Development of appropriate rates is the key to commercialization. The criteria used to evaluate rate types are maximum combined utility and customer benefits, ease of commercialization, and practical feasibility. Rate types include demand charges, time of use rates, and two forms of load management rates, and the possibility of utility ownership is considered. ERA

**N77-33650#** Institute of Gas Technology, Chicago, Ill  
**EXPERIMENTAL PROGRAM FOR THE DEVELOPMENT OF PEAT GASIFICATION** Interim Report, 10 Feb. - 30 Jun. 1976

30 Jun 1976 21 p  
(Contract E(49-18)-2489)  
(FE-2489-3, IR-1) Avail NTIS HC A02/MF A01

The physical structure and chemical composition of peat were studied and found to be significantly different from those of coal. It was found that drying and grinding peat decreases its liquid absorption capacity. Toluene was the least absorbed, of fire potential slurry media, followed by acetone, propanol, ethanol, and water. Results show that the total liquid absorbed was only slightly less when it was first soaked briefly in water and then in toluene than in the reverse order. Slurrability tests show that about 67 weight percent toluene is required to make a pumpable slurry. Results of thermobalance tests show that initial devolatilization in nitrogen slows the gasification in hydrogen. ERA

**N77-33652#** Princeton Univ., N J Dept of Aerospace and Mechanical Sciences

**OPTIMIZATION AND CHARACTERISTICS OF A SAILWING WINDMILL ROTOR** Final Report, 1 Feb. 1976 - 31 Jan. 1976

M D Maughmer 31 Jan 1976 86 p refs Sponsored in part by ERDA  
(Grant NSF GI-41891)  
(NSF/RANN/GI-41891/FR/75/4) Avail NTIS HC A05/MF A01

A detailed accounting of the development and operational techniques of the Princeton moving vehicle windmill testing facility is presented. Also presented is a complete documentation of the performance build-up of a 12 foot diameter, two bladed Sailwing rotor. An examination of an exploratory research effort directed toward using a small, first stage, co-axial rotor to augment windmill performance is included. Finally considered are the results and conclusions of an extensive wind tunnel test program aimed at a quantitative determination of the aerodynamic penalties associated with numerous simplifications of the basic double membraned Sailwing cross section. ERA

**N77-33654#** Sandia Labs., Albuquerque, N Mex  
**SOLAR RADIATION AVAILABILITY FOR NEW MEXICO**

E C Boes Feb 1977 18 p  
(Contract EY-76-C-04-0789)  
(SAND-77-0004) Avail NTIS HC A02/MF A01

An elementary description is given of the basic geometric considerations and background information on solar radiation availability. In addition, tables giving both average and clear day solar energy availabilities in the four seasons are presented. The solar energy available to a collector depends on the collector type and its orientation. The availabilities are presented for a wide variety of possible surface orientations, including orientations for focusing collectors, tracking collectors, and fixed collectors. ERA

**N77-33655#** California Univ., Berkeley Lawrence Berkeley Lab

**ECOLOGICAL CONSIDERATIONS OF THE SOLAR ALTERNATIVES**

Mark Davidson, Donald Grether, and Kenneth Wilcox Feb 1977 48 p refs

(Contract W-7405-eng-48)  
(LBL-5927) Avail NTIS HC A03/MF A01

The main solar technologies are considered including solar thermal power, photovoltaic cells, ocean thermal power, wind energy, solar heating and cooling, bioconversion, and agricultural and process heat. The direct and indirect ecological and environmental impacts of these technologies are discussed. ERA

**N77-33657#** TRW Defense and Space Systems Group, Redondo Beach, Calif Environmental, Power and Facilities Dept  
**PLANNING AND DESIGN OF ADDITIONAL EAST MESA GEOTHERMAL TEST FACILITIES. PHASE 1B, VOLUME 2: PROCUREMENT PACKAGE**

R O Pearson 15 Oct 1976 375 p refs  
(Contract EY-76-C-03-1140, E(04-3)-1140)  
(SAN/1140-1/2-Vol-2) Avail NTIS HC A16/MF A01

Procurement packages of technical specifications and construction drawings for eleven test facilities are presented. Each of the specifications includes all of the technical requirements needed for procurement and construction. The information is presented under the following subject headings: injection pump system, injection pipeline, control and instrumentation spools, calibration test bench, test pad modifications, test pad piping headers, production and injection wells, well 5-2 modifications, well 8-1 down-hole pump, well 6-1 down-hole pump, and well 8-1 booster pump. ERA

**N77-33660#** TRW Systems Group, McLean, Va  
**SYSTEMS STUDIES OF ENERGY CONSERVATION METHANE PRODUCED FROM COALBEDS, VOLUME 1**

Jan 1977 164 p refs 2 Vol  
(Contract E(46-1)-8042)  
(MERC/CR-77/4-Vol-1) Avail NTIS HC A08/MF A01

Utilization of coalbed methane gas in a practicable and economically favorable manner was studied. The drainage method decreases the quantity of methane released into the environment, reduces ventilation requirements, and enhances mining safety. Legal problems and possible litigations may result when coalbed methane gas is recovered and utilized in a profitable venture since coal right agreements do not imply the right to recover gas released in conjunction with mining requirements. Systems engineering and legal problems are analyzed in detail. IM

**N77-33662#** Mitre Corp., McLean, Va METREK Div  
**INTERAGENCY ENERGY/ENVIRONMENT RESEARCH AND DEVELOPMENT PROGRAM: STATUS REPORT 3**

Richard Laska Apr 1977 62 p  
(Contract EPA-68-01-3188)  
(PB-267443/0, M77-19) Avail NTIS HC A04/MF A01 CSCL 10A

The EPA-planned and coordinated Interagency Energy/Environment R&D Program is presented. The introduction describes the history, purpose, and scope of the Interagency Program. The second section describes project activity in the five Process and Effects categories. The third section deals with projects underway in the nine Control Technology categories. GRA

**N77-33664#** Federal Energy Administration, Washington, D C Office of Coal, Nuclear and Electric Power Analysis  
**SOLAR COLLECTOR MANUFACTURING ACTIVITY Semiannual Report, Jul. - Dec. 1976**

Richard D Stoll Apr 1977 27 p  
(PB-266985/1, FEA/B-77/135) Avail NTIS HC A03/MF A01 CSCL 10A

A survey of private firms that have manufactured and sold solar collectors during the second half of calendar year 1976.

was conducted for the purpose of obtaining descriptive statistics on economic activity in the solar heating and cooling area and identifying production growth in this industry. Results show that production during the second half of 1976 was 73 percent greater than during the first half of 1976, total production for 1976 was 168 percent greater than that of 1975. GRA

**N77-33667#** Massachusetts Inst of Tech Cambridge Aeroelastic and Structures Research Lab  
**WIND ENERGY CONVERSION Final Report, Feb. 1975 - Oct. 1976**

R H Miller, M Martinez-Sanchez, J Dugundji, E E Larrabee, I Chopra, T Humes, S Y Chung, J C Gohard, and J T Edwards  
Oct 1976 431 p refs Sponsored in part by ERDA  
(Grant NSF AER-75-00826)  
(PB-268718/4, ASRL-TR-184-3 NSF/RA-760569,  
ERDA/NSF-00826-75/3) Avail NTIS HC A19/MF A01 CSCL 10B

Various problems associated with the design of horizontal axis, low solidity, and high performance wind turbines are investigated. Wind turbine performance as determined from various elementary and more refined momentum theories, aerodynamic vortex theories for blade loadings including unsteady effects and wind shear velocity gradients, and nonlinear dynamic response of rotor blades including gravity and wind shear excitation were studied. GRA

**N77-33668#** Michigan Governor's Commission on Electric Power Alternatives Lansing

**REPORT OF THE ADVISORY COMMISSION ON ELECTRIC POWER ALTERNATIVES Final Report**

2 Sep 1976 104 p  
(PB-268479/3) Avail NTIS HC A06/MF A01 CSCL 10A

The general trends in the rates of growth of the demand for electric energy both in the nation and in Michigan are examined. The accuracy of utility industry and state government projections of such electric energy demand growth is assessed, and alternatives that will provide the consumers of Michigan with an adequate supply of electric power are discussed. GRA

**N77-33669#** National Bureau of Standards, Washington, D C Architectural Research Section

**WINDOW DESIGN STRATEGIES TO CONSERVE ENERGY Final Report**

S Robert Hastings and Richard W Crenshaw Jun 1977 207 p refs Sponsored in part by HUD  
(Contract E(49-1)-3800)  
(PB-269297/8, NBS-BSS-104) Avail NTIS  
HC A10/MF A01 CSCL 13M

Design strategies for energy efficient windows are presented. The physical phenomena responsible for each strategy's energy performance is explained, and energy and non-energy advantages and disadvantages are summarized. Aesthetic considerations, cost approximations, example installations, and laboratory studies are presented. The overall purpose is to draw attention to the wide range of options currently available to conserve energy with windows. Author

**N77-33670#** Baker (Michael, Jr.) of New York, Inc., N Y  
**DESIGN GUIDELINES FOR ENERGY CONSERVING SYSTEMS Final Report**

A Salim Qureshi, Griswold L Moeller, and Eugene Gore Mar 1977 131 p refs  
(Contract V-101C-266)  
(PB-268989/1, VA-99-R070-2) Avail NTIS  
HC A07/MF A01 CSCL 10A

Analysis of design guidelines and design limitations for the selection, evaluation and design of solar energy systems, total energy and selective energy systems, continuous duty standby systems, engine driven chiller/heat pump systems, and solid waste boiler systems are presented. GRA

**N77-33671#** General Accounting Office, Washington, D C Energy and Minerals Div  
**ENERGY POLICY DECISIONMAKING, ORGANIZATION, AND NATIONAL ENERGY GOALS**

24 Mar 1977 55 p refs

(PB-269299/4, EMD-77-31) Avail NTIS HC A04/MF A01 CSCL 10A

A number of gaps in the energy policy decisionmaking process which show the need for better coordination among agencies carrying out energy functions and for establishing a system of priorities among energy goals are identified. In addition, energy reorganization and several issues which the Congress should address in enacting legislation to reorganize the Federal energy structure are discussed. GRA

**N77-33672#** Transportation Systems Center, Cambridge, Mass  
**ENERGY STATISTICS: A SUPPLEMENT TO THE SUMMARY OF NATIONAL TRANSPORTATION STATISTICS Annual Report, 1945 - 1976**

William F Gay Aug 1976 144 p refs  
(PB-269301/8, DOT-TSC-OST-76-30) Avail NTIS  
HC A07/MF A01 CSCL 10A

Selected time series data describing the transportation, production, processing, and consumption of energy are presented. The revenues and expenses of oil pipeline, companies number and capacities of U S tank ships, and the total crude oil transported in the U S by method of transportation, growth over time of the U S oil and natural gas reserves, refinery capacity, and yields, and trends in the demand for fuel and power are included. GRA

**N77-33673#** National Bureau of Standards, Washington, D C Office of Building Standards and Codes Services

**BUILDING ENERGY CONSERVATION PROGRAMS. A PRELIMINARY EXAMINATION OF REGULATORY ACTIVITIES AT THE STATE LEVEL Final Report**

Patrick W Cooke and Robert M Eisenhard Jun 1977 124 p refs Sponsored in part by Federal Energy Admin and ERDA  
(PB-268873/7, NBSIR-77-1259) Avail NTIS  
HC A06/MF A01 CSCL 10A

Background information on the current regulatory status and degree of implementation of building energy conservation programs at the state level are described, including those programs dealing with solar energy. This data base can be drawn upon to promote utilization of building thermal efficiency standards on a uniform basis throughout the country. From information collected in a survey of twenty-one states, the report presents the current state-of-the-art on common problems experienced at the state level in the promulgation and implementation of building energy conservation regulations. Based on these findings, several types of assistance that could facilitate the orderly adoption and implementation of uniform standards are identified. GRA

**N77-33674#** Mitre Corp., McLean, Va METREX Div  
**PUBLIC PARTICIPATION IN ENERGY RELATED DECISION MAKING, EDITED TRANSCRIPTS**

Herbert Benington Jan 1977 413 p Workshop held at McLean, Va, 21-22 Sep 1976 Prepared in cooperation with the National Academy of Public Administration, Washington, D C  
(Contract NSF C-1044 Grant NSF PRA-75-21960)  
(PB-268781/2, MTR-7367, NSF/PRA-7521960/3/7) Avail  
NTIS HC A18/MF A01 CSCL 10A

Edited transcripts of presentations and discussion of plenary sessions of a workshop on public participation in energy related decision making are given. The emergency core cooling system rule making, the consideration of energy parks in Pa and the Seabrook, New Hampshire nuclear station decisions are summarized and the process of public participation in each decision is analyzed by participants in the respective cases. Also summarized are the North Anna decision, the Sears Island decision and the Big Rock Point decision. The focus of the workshop is on the processes of public participation and how it may be improved. GRA

**N77-33675#** National Energy Information Center, Washington, D C  
**ENERGY INTERRELATIONSHIPS A HANDBOOK OF TABLES AND CONVERSIONS FACTORS FOR COMBINING AND COMPARING INTERNATIONAL ENERGY DATA**

Nathaniel B Guyol Jun 1977 64 p refs  
(PB-269034/5, FEA/B-77/166) Avail NTIS  
HC A04/MF A01 CSCL 10A

Facts about the nature measurement comparison and utilization of energy commodities are provided. Precise factors for moving from one system of measurement to another are described. Particular energy commodities and their energy values are indicated. A set of tables is given for reducing different energy commodities, measured in their customary units, to any one of the ten units commonly employed in combining or comparing energy data. GRA

**N77-33677# Atomic Industrial Forum, Inc. Washington D C  
ROLE OF NUCLEAR POWER IN MEETING FUTURE U S  
ENERGY NEEDS**

E A Wiggins 1977 14 p Presented at Intern Conf on Nucl Power and its Fuel Cycles, Salzburg, Austria, 2 May 1977  
(IAEA-CN-36/396, Conf-770505-272) Avail NTIS  
HC A02/MF A01

The likelihood of the U S industry's further commitment to nuclear power vis-a-vis comparable commitments in other parts of the world is considered. Those commitments may be contingent upon closing the nuclear fuel cycle. The extent to which such commitments will be influenced by government policy and regulation, financing and manpower requisites, and the challenge of the critics is also addressed. Finally, this paper points out ways in which nuclear power is already a de facto key to a U S national energy policy and how it can further contribute to the goal of energy independence. ERA

**N77-33678# Oak Ridge National Lab, Tenn  
TECHNICAL AND ECONOMIC STUDIES OF SMALL  
REACTORS FOR SUPPLY OF ELECTRICITY AND STEAM**

I Spiewak 1977 17 p refs Presented at Intern Conf on Nucl Power and its Fuel Cycles, Salzburg (Austria), 2 May 1977  
(IAEA-CN-36/398, Conf-770505-269) Avail NTIS  
HC A02/MF A01

Several nuclear steam supply systems in the small and intermediate size range were studied. Detail studies are reported of the Consolidated Nuclear Steam Generator, a 313 MW(t) pressurized water reactor, as applied to industrial energy needs. Both conventional and barge-mounted nuclear steam supply systems are considered. Conceptual studies have been started of pressurized and boiling water reactors in the range of 1000 MW(t), which are envisioned for utility operation for supply of electric power and steam. Design studies of a 500 MW(t) high temperature reactor are also reported. The small reactors are expected to have higher unit costs than the large commercial plants, but to have compensating advantages in high plant availability, shorter construction schedule and greater siting flexibility. Studies are also reported of power cycle parameters and cost allocations for extraction of steam from steam turbine plants. ERA

**N77-33679# International Institute for Applied Systems Analysis,  
Laxenburg (Austria)  
ENERGY OPTIONS OPEN TO MANKIND BEYOND THE  
TURN OF THE CENTURY**

W Haefele 1977 15 p refs Presented at Intern Conf on Nucl Power and its Fuel cycles, Salzburg, Austria 2 May 1977  
(IAEA-CN-36/538) Avail NTIS HC A02/MF A01

The implications of nuclear waste disposal schemes, the releases of large amounts of conversion heat losses as well as security considerations make it necessary to establish also a broad, long range global context for assessments of nuclear energy. The leading consideration is the evolution of the global energy demand. The growth rate in the industrialized nations, the development of the developing nations, and the population growth are considered in some detail. Also, long range trends from labor intensive economies that are mostly agriculture-oriented to energy and/or capital intensive economies are analyzed. The availability of energy reserves and the potential of energy resources is the second line of analysis. Investment requirements and

implications of various environmental considerations, specifically those that are global in nature, are considered. Several scenarios for the buildup of future energy systems are studied. Energy storage and transportation, capital and foreign currency constraints, and various degrees of centralization respectively decentralization are evaluated. ERA

**N77-33680# Organization for Economic Co-Operation and  
Development, Paris (France)  
WORLD ENERGY SUPPLY AND DEMAND AND THE  
FUTURE OF NUCLEAR POWER**

U Jantzie 1977 15 p Presented at Intern Conf on Nucl Power and its Fuel Cycles, Salzburg (Austria) 2 May 1977  
(IAEA-CN-36/583, Conf-770505-339) Avail NTIS  
HC A02/MF A01

The Organization for Economic Cooperation and Development (OECD's) world energy outlook analyzed projected trends in energy demand and supply for the OECD area and other major global regions to 1985. It provides a brief discussion of trends after 1985. OECD energy consumption is projected to grow more slowly than in the past. Conservation effects will increase efficiency of energy use per unit of economic growth. All domestic energy supplies in the OECD are projected to expand faster than in the past. The relative share of non-fossil energy sources in total production will be almost doubled. Assuming moderate economic growth, existing energy policies, and a constant real price for oil, the outlook's reference case projects OECD oil import at 35 million barrels a day by 1985. This level of import demand when combined with the import needs of other oil importing areas, could approach the limit of availability of world oil supplies and as a result cause severe disequilibrium in world energy markets. ERA

**N77-33681# Atomic Reactor Centre, Bandung (Indonesia)  
NUCLEAR POWER ASPECTS IN AN OIL AND COAL  
PRODUCING COUNTRY**

J Ilijas 1977 24 p refs Presented at Intern Conf on Nucl Power and its Fuel cycles, Salzburg (Austria), 2 May 1977  
(IAEA-CN-36/175, Conf-770505-254) Avail NTIS  
HC A02/MF A01

Known energy reserves and their potential in the Indonesian Archipelago are described. Resources comprise, next to oil, a significant amount of bituminous coal, natural gas, some hydro and geothermal power and some radioactive minerals. The possible use of solar and wind energy on the eastern Indonesian islands is discussed. A number of studies have suggested the use of coal and nuclear power as the most economical resources to replace oil. A number of constraints, for both coal and nuclear power, are discussed. A comparison study is made of coal versus nuclear power under the present local conditions. The prospects of nuclear power are reviewed including the initial steps leading thereto, which have already been taken. In this connection the role of a domestic nuclear industry is being discussed, and also the accelerating effect it may have in the distant future on the growth of electricity from nuclear energy. ERA

**N77-33688# Naval Civil Engineering Lab, Port Hueneme, Calif  
THE BIODEGRADATION OF OIL IN SEA WATER FOR  
NAVAL POLLUTION CONTROL Final Report, 1974 - 1976**

Thomas B O'Neill 1 Jul 1977 15 p refs  
(AD-A042375) Avail NTIS HC A02/MF A01 CSCL 06/1  
The report describes the isolation and utilization of pure and mixed microbial cultures for experiments on the biodegradation of crude oil Bunker C fuel and marine diesel. Many microbial species were found that had hydrocarbonoclastic activity. When pure cultures were combined in mixtures the activity was much greater. 91% oxidation in seven days, than the activity of any one of the component species when used in a pure culture.

Author (GRA)

**N77-33700# Pacific Environmental Services, Inc., Santa Monica,  
Calif  
RELIABILITY STUDY OF VAPOR RECOVERY SYSTEMS AT  
SERVICE STATIONS**

R J Bryan, L G Wayne, and R L Norton Mar 1976 102 p  
(Contract EPA-68-02-1405)  
(PB-267613/8, EPA-450/3-76-001) Avail NTIS  
HC A06/MF A01 CSCL 13B

A study was conducted of the operational reliability of vapor recovery systems at gasoline service stations in San Diego County, California. Periodic inspections at 24 stations were conducted to examine the condition of these systems, to determine their operational status, and to check for detectable gasoline vapor losses from control equipment. The study demonstrated that capture of vapors at the vehicle was more effective with vacuum-assisted systems than with vapor balance systems. However, the reliability of the vacuum-assisted systems was not good in general although there was substantial variation depending upon the type of unit. GRA

**N77-33968#** Oak Ridge National Lab., Tenn Engineering Technology Div

**SURVEY OF NUCLEAR FUEL CYCLE ECONOMICS: 1970 - 1985**

B E Prince, J P Peerenboom, and J G Delene Mar 1977 142 p refs

(Contract W-7405-eng-26)

(ORNL-TM-5703) Avail NTIS HC A07/MF A01

Factors are presented that may affect nuclear fuel cycle economics through about 1985. The nuclear fuel cycle was surveyed as to past trends, current problems, and future considerations. Unit costs were projected for each step in the fuel cycle. Nuclear fuel accounting procedures were reviewed, methods of calculating fuel costs were examined, and application was made to Light Water Reactors (LWR) over the next decade. A method conforming to Federal Power Commission accounting procedures and used by utilities to account for backend fuel-cycle costs was described which assigns a zero net salvage to discharged fuel. LWR fuel cycle costs of from 4 to 6 mills/kWhr (1976 dollars) were estimated for 1985. These are expected to reach 6 to 9 mills/kWhr if the effect of inflation is included. ERA

**N77-34049#** National Aeronautics and Space Administration, Washington, D C

**SPINOFF 1977: AN ANNUAL REPORT**

James J Haggerty Jan 1977 117 p Original contains color illustrations

(NASA-TM-74908) Avail NTIS MF A01, SOD HC \$3 10 CSCL 05B

Direct and indirect benefits of space technology are reviewed. Applications in medicine, agriculture, solar energy technology, transportation, and other fields are discussed. JLH

**N77-34050#** National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

**PRELIMINARY DESIGN STUDY OF A BASELINE MIUS**

Barry M Wolfer, Vernon E Shields, James O Rippey, Harmon L Roberts, Richard C Wadle, Steven P Wallin, William L Gill, E H White (Heimsath (Louis) Associates), and R Monzingo (Boeing Co., Seattle, Wash) Apr 1977 262 p refs

(NASA-TM-X-58193, JSC-11625) Avail NTIS  
HC A12/MF A01 CSCL 13B

Results of a conceptual design study to establish a baseline design for a modular integrated utility system (MIUS) are presented. The system concept developed a basis for evaluating possible projects to demonstrate an MIUS. For the baseline study, climate conditions for the Washington, D C, area were used. The baseline design is for a high density apartment complex of 496 dwelling units with a planned full occupancy of approximately 1200 residents. Environmental considerations and regulations for the MIUS installation are discussed. Detailed cost data for the baseline MIUS are given together with those for design and operating variations under climate conditions typified by Las Vegas, Nevada, Houston, Texas, and Minneapolis, Minnesota. In addition, results of an investigation of size variation effects, for 300 and 1000 unit apartment complexes, are presented. Only conceptual aspects of the design are discussed. Results regarding energy

savings and costs are intended only as trend information and for use in relative comparisons. Alternate heating, ventilation, and air conditioning concepts are considered in the appendix. Author

**N77-34058#** Little (Arthur D) Inc., Cambridge, Mass

**EVALUATION OF THE DISPOSAL OF FLUE GAS DESULFURIZATION WASTES IN MINES AND THE OCEAN: INITIAL ASSESSMENT Progress Report, Jul 1975 - Jul 1976**

R R Lunt, C B Cooper, S L Johnson, J E Oberholtzer, G R Schimke, and W I Watson May 1977 318 p refs

(Contract EPA-68-03-2334)

(PB-269270/5, EPA-600/7-77-051)

Avail NTIS  
HC A14/MF A01 CSCL 13B

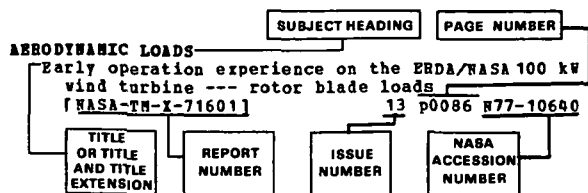
Environmental, technical, regulatory, and economic aspects of the use of disposal sites were evaluated. Available data on chemical and physical properties of both treated and untreated sludges generated in ongoing environmental and privately funded sludge characterization programs were also collected and summarized. GRA

# SUBJECT INDEX

ENERGY/A Continuing Bibliography (Issue 16)

JANUARY 1978

## Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title or title and title extension provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g. NASA report translation, NASA contractor report). The issue page and accession numbers are located beneath and to the right of the title, e.g. 13 p0086 N77-10640. Under any subject heading, the accession numbers are arranged in sequence with the IAA accession numbers appearing first.

## A

### ABIOTENESIS

Chemical evolution of photosynthesis 13 p0071 A77-18898

### ABSORBENTS

Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106

Oil and fat absorbing polymers [NASA-CASE-NPO-11609-2] 16 p0532 A77-31308

### ABSORBERS (EQUIPMENT)

Optimization of absorption air-conditioning for solar energy applications [NASA-CR-150176] 14 p0210 A77-17560

### ABSORBERS (MATERIALS)

Survey of selective absorber coatings for solar energy technology 14 p0199 A77-29067

Temperature dependence of the 10.6-microns reflectivity of ITO-coated silicon --- selective absorber for solar energy conversion application 14 p0200 A77-29246

Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407

Collector with cusplike compound parabolic concentrator and selective absorber 16 p0474 A77-48955

### ABSORPTANCE

Applications of thin graded-index films to solar absorbers 15 p0260 A77-31244

Fermi function model absorption profile for solar-thermal conversion 16 p0483 A77-49035

### ABSORPTION

Survey of absorption refrigeration systems 13 p0078 A77-19105

### ABSORPTION SPECTRA

Study and materialization of a selective surface designed for direct thermal conversion of solar energy - Application to medium temperature range 13 p0069 A77-18496

Infrared extinction spectra of some common liquid aerosols 15 p0290 A77-34561

Upper limit of efficiency for photovoltaic solar cells 16 p0399 A77-40568

### ABSORPTION SPECTROSCOPY

Measurements of Sc I gf-values --- absorption spectroscopy using heat pipe oven 13 p0058 A77-16270

### ABSORPTIVITY

The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors 16 p0502 A77-50214

Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219

Solar absorption characteristics of several coatings and surface finishes --- for solar energy collectors [NASA-TM-X-3509] 14 p0229 A77-20567

### ABSTRACTS

Abstracts: 1976 AFOSR Contractors' meeting on MHD Power Generation and Lasers 13 p0133 A77-15845

Vertical-axis wind turbine technology workshop [SAND-76-5586] 14 p0250 A77-21688

Solar energy environmental and resource assessment program [ERDA-76-138] 15 p0344 A77-22621

Photovoltaic conversion program [ERDA-76-161] 16 p0538 A77-31653

Federal energy information locator system: Energy information in the federal government [PB-262331/2] 16 p0539 A77-31661

Health effects of pollutants associated with fossil-fuel power generation: An indexed bibliography with abstracts [UCD-472-500] 16 p0540 A77-31672

### AC GENERATORS

Alternating photoelectrochemical converters 13 p0077 A77-19093

Air Force applications of lightweight superconducting machinery 14 p0144 A77-21360

High speed superconducting generator 14 p0144 A77-21383

Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator 14 p0144 A77-21386

Armature of the MIT-EPRI superconducting generator 14 p0157 A77-22575

Research and development of cryoalternators for large-electrical power systems 14 p0190 A77-26536

High-power systems with ac generators and inertial storage banks for electrophysical devices 15 p0261 A77-31426

Exact 60 cycle power generation at any speed --- for windmill applications 16 p0450 A77-48759

Demonstration of a Free-Piston Stirling Linear Alternator power conversion system 16 p0465 A77-48880

High power study - power conditioning --- for magnetohydrodynamic generators and turbine driven alternators [AD-A038724] 16 p0522 A77-29625

Demonstration of an inductor motor/alternator/flywheel energy storage system [COO-4010-1] 16 p0535 A77-31620

### ACCELERATED LIFE TESTS

Test and evaluation of the Navy half-watt RTG --- Radioisotope Thermoelectric Generator 13 p0042 A77-12853

Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750

- Contribution to procedures for testing Silazan resin coatings --- for solar concentrators  
16 p0443 A77-48522
- ACCELERATING AGENTS**  
The use of functionalized polymers as photosensitizers in an energy storage reaction  
16 p0501 A77-50208
- ACCELERATORS**  
Mass driver retrievals of earth-approaching asteroids --- earth orbit capture for mining purposes  
[AIAA PAPER 77-528] 15 p0265 A77-32053
- ACCIDENT PREVENTION**  
Hydrogen safety problems --- fuel systems hazard prevention  
15 p0283 A77-33402  
Hydrogen safety problems  
14 p0245 N77-21640
- ACETYLENE**  
Conductivity of seeded combustion products of acetylene systems  
15 p0288 A77-34039
- ACIDITY**  
Evolution of atmospheric pollution /high acidity and black fumes/ in France during 1975  
13 p0002 A77-10670
- ACIDS**  
Surface research for development of new electrocatalysts for acid electrolyte fuel cells  
[AD-A026053] 13 p0131 N77-15517  
Investigation of acid-resistant electrocatalysts for fuel cells  
[NASA-TT-F-17367] 14 p0207 N77-16444  
Study of the auxiliaries for lead-acid battery systems for peaking power  
[CONS/2114-3] 16 p0556 N77-33634
- ACOUSTIC MEASUREMENTS**  
Geothermal exploration: An evaluation of the microseismic groundnoise method  
[PB-262575/4] 15 p0343 N77-22603
- ACOUSTIC PROPERTIES**  
Acoustic properties of subsonic MHD channel  
13 p0054 A77-15668
- ACOUSTIC VELOCITY**  
Study of the properties of heat pipes with liquid-metal heat-transfer agents in low-temperature regimes  
13 p0046 A77-13243
- ACOUSTICS**  
Advances in engineering science, volume 3  
[NASA-CP-2001-VOL-3] 13 p0084 N77-10305
- ACTINOMETERS**  
Basis for developing a solar energy inventory  
14 p0179 A77-25360  
Fundamentals of solar-energy survey development  
16 p0409 A77-41910
- ACTIVATED CARBON**  
Multi-stage activation of brown-coal chars with oxygen  
16 p0401 A77-41319
- ACTIVITY (BIOLOGY)**  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations  
[PB-261910/4] 15 p0350 N77-22688
- ADAPTIVE CONTROL**  
Automatic optimization of operating modes in thermionic electrical power generators  
[IAF PAPER 77-142] 16 p0507 A77-51445
- ADDITIVES**  
Study of the icization of the additive in MHD installations  
13 p0002 A77-10424  
New potentials for conventional aircraft when powered by hydrogen-enriched gasoline  
15 p0281 A77-33392  
Synthetic additives for SO<sub>2</sub> removal from combustion gas in a fluidized-bed coal combustor  
15 p0293 A77-35168  
Fuels and fuel additives for highway vehicles and their combustion products. Guide to evaluation of their potential effects on health  
[PB-254088/8] 13 p0084 N77-10222  
Optimization of Pt-doped Kccite (trademark) electrodes in H<sub>2</sub> PO<sub>4</sub> fuel cells  
[AD-A025326] 13 p0107 N77-12529
- ADSORBENTS**  
On the storage of hydrogen by use of cryo-adsorbents  
15 p0283 A77-33408
- Use of adsorbent beds for energy storage in drying of heating systems  
16 p0405 A77-41577
- Chromatographic determination of adsorption and diffusion in a bidispersed porous solid  
[LBL-5273] 16 p0532 N77-31269
- ADSORPTION**  
Hydrogen absorption in Ti3Al  
16 p0506 A77-51372  
Cooling subsystem design in CUS solar house 3  
[COO-2858-1] 16 p0514 N77-28592  
Chromatographic determination of adsorption and diffusion in a bidispersed porous solid  
[LBL-5273] 16 p0532 N77-31269
- AEOLIAN TONES**  
Evaluation of wind-energy sites from aeolian geomorphologic features mapped from LANDSAT imagery. First results  
[ERDA/NSF-00598/75/T1] 14 p0218 N77-18667
- AERIAL PHOTOGRAPHY**  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121  
Use of radar in geology  
13 p0018 A77-12256  
The uses of air photography /2nd edition/ --- Book  
15 p0295 A77-35675  
Regional energy availability from conversion of solid waste  
15 p0304 A77-36433  
Construction and interpretation of a digital inertia image --- of Pisgah Crater and Latic Lake in Southern California  
16 p0421 A77-44464  
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia  
[PB-266769/9] 16 p0527 N77-30589
- AERODYNAMIC CHARACTERISTICS**  
Potential aerodynamic analysis of horizontal-axis windmills  
[AIAA PAPER 77-132] 14 p0135 A77-19848  
The technical concept of the IL-62M. II - Fuel system  
14 p0156 A77-22120  
Engineering development status of the Darrieus wind turbine  
14 p0166 A77-23365  
Analysis of the wind-driven reciprocator  
14 p0183 A77-26088  
Aerodynamic design of a conventional windmill using numerical optimization  
14 p0199 A77-29070  
Potential application of radial splitter diffuser to shrouded wind turbines  
14 p0199 A77-29071  
Fundamentals of aerodynamic design: Propellers /2nd enlarged edition/ --- Serbo-Croatian book  
15 p0317 A77-37949  
Compact shrouds for wind turbines  
16 p0416 A77-42891  
The effect of aerofoil characteristics on windmill performance  
16 p0438 A77-47880  
Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills  
16 p0467 A77-48896  
Some contributions to aerodynamic theory for vertical axis wind turbines  
16 p0467 A77-48897  
Experimental data and theoretical analysis of an operating 100 kW wind turbine  
16 p0467 A77-48898  
Fluid dynamics of diffuser augmented wind turbines  
16 p0467 A77-48899  
Study of unconventional aircraft engines designed for low energy consumption  
[NASA-CR-135136] 13 p0127 N77-15043  
A 100-kW wind turbine blade dynamics analysis, weight-balance, and structural test results  
[NASA-CR-134957] 14 p0236 N77-21460
- AERODYNAMIC COEFFICIENTS**  
Aerodynamics of the Darrieus rotor  
13 p0050 A77-14559
- AERODYNAMIC CONFIGURATIONS**  
Layout and flight performance of a hypersonic transport /HST/  
[DGLF PAPER 76-198] 13 p0060 A77-16575



- The optimum configuration of rotor blades for horizontal wind energy converters  
[NASA-TT-P-17379] 14 p0210 N77-17562
- AERODYNAMIC DRAG**  
Wind tunnel investigation of devices to reduce bus aerodynamic drag  
[AIAA PAPER 77-307] 13 p0066 A77-18232  
Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft  
[SAE PAPER 77C470] 15 p0310 A77-37088  
An overview of concepts for aircraft drag reductions  
16 p0543 N77-32092
- AERODYNAMIC LOADS**  
Early operation experience on the ERDA/NASA 100 kW wind turbine --- rotor blade loads  
[NASA-TM-X-71601] 13 p0C86 N77-10640
- AERODYNAMICS**  
Aerodynamics as a subway design parameter  
13 p0070 A77-18721  
Sandia vertical-axis wind turbine project  
[SAND-76-0581] 16 p0521 N77-29613
- AEROELASTICITY**  
Segmented and self-adjusting wind turbine rotors  
16 p0468 A77-48902  
Wind energy conversion  
[PB-268718/4] 16 p0559 N77-33667
- AERONAUTICAL ENGINEERING**  
Aircraft fuel conservation technology. Task force report, September 10, 1975  
[NASA-TM-X-74295] 13 p0C93 N77-11055  
Technology requirements for advanced earth-orbital transportation systems: Summary report --- single stage to orbit vehicles  
[NASA-CR-2867] 16 p0550 N77-33255
- AERONAUTICS**  
National Meeting on Air and Space Law, 7th, Universidad Nacional de Cordoba, Cordoba and La Falda, Argentina, August 13-16, 1975, Proceedings  
13 p0053 A77-15050
- AEROSOLS**  
Aerosol formation during coal combustion - Condensation of sulfates and chlorides on flyash  
13 p0054 A77-15778  
Raman scattering and the characterisation of atmospheric aerosol particles  
15 p0262 A77-31487  
Infrared extinction spectra of some common liquid aerosols  
15 p0290 A77-34561  
Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere  
[PB-253375/0] 13 p0092 N77-10715  
Aerosol research and development related to health hazards analysis  
[LA-6539-PR] 15 p0385 N77-26703  
Design of minimum-weight diffusion batteries  
[PB-266217/9] 16 p0518 N77-28645
- AEROSPACE ENGINEERING**  
OTEC - Aerospace and ocean engineering in partnership --- Ocean Thermal Energy Conversion  
[AIAA PAPER 77-296] 13 p0066 A77-18227  
Energy and aerospace /Sixty-fifth Wilbur and Orville Wright Memorial Lecture/ --- aerospace contributions to energy conservation  
15 p0304 A77-36434  
The roles of aerospace organizations in energy development or can aerospace success bring success in energy  
[AIAA PAPER 77-1001] 16 p0408 A77-41855  
Space solar power systems  
14 p0213 N77-17690  
Applications of aerospace technology to petroleum exploration. Volume 1: Efforts and results  
[NASA-CR-152694] 15 N77-22741  
Applications of aerospace technology to petroleum exploration. Volume 2: Appendices  
[NASA-CR-152693] 15 p0351 N77-22742  
Space benefits: The secondary application of aerospace technology in other sectors of the economy  
[NASA-CR-152685] 15 p0352 N77-23010  
Proceedings of the ASPE/MSFC Symposium on Engineering and Productivity Gains from Space Technology  
[NASA-CP-2019] 16 p0525 N77-30273  
Space power technology applied to the energy problem  
16 p0526 N77-30294
- AEROSPACE ENVIRONMENTS**  
Environmental impact of space manufacturing  
[AIAA PAPER 77-539] 15 p0266 A77-32062
- AEROSPACE INDUSTRY**  
Legal and economic prerequisites to space industrialization  
[IAP PAPER ISL-76-29] 13 p0004 A77-10968  
Energy - An emerging role for aerospace  
14 p0166 A77-23363  
The roles of aerospace organizations in energy development or can aerospace success bring success in energy  
[AIAA PAPER 77-1001] 16 p0408 A77-41855  
Creating a welcome for aerospace energy technology  
16 p0413 A77-42561  
Domestic and world trends (1980 - 2000) affecting the future of aviation  
[NASA-CR-144838] 13 p0126 N77-14981
- AEROSPACE SYSTEMS**  
Gas turbine electric powerplants  
[AIAA PAPER 77-346] 13 p0066 A77-18254  
Powersat - An astronautical energy solution  
14 p0176 A77-24520  
Space and energy; Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975  
16 p0432 A77-46787  
Extraterrestrial resources and astronautics --- Russian book  
16 p0499 A77-49400
- AEROSPACE TECHNOLOGY TRANSFER**  
Spinoff 1977: An annual report  
[NASA-TM-74908] 16 p0561 N77-34049
- AEROTHERMODYNAMICS**  
Aerothermic power plant with artificial cyclone  
13 p0077 A77-19098
- AFRICA**  
Formulation of energy policies - The case of West Africa  
13 p0080 A77-19124  
Rural energy centre for Africa using solar, wind and biogas energies  
16 p0496 A77-49139
- AGING (BIOLOGY)**  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations  
[PB-267937/1] 16 p0554 N77-33619
- AGING (MATERIALS)**  
Accelerated heat-aging studies on fluororubber in various media  
15 p0264 A77-31750  
Weatherability of solar energy utilization materials: Preliminary discussions  
[CONF-760821-11] 14 p0225 N77-19650
- AGRICULTURE**  
Parametric studies of applications of controlled thermonuclear reactor fusion energy for food production  
14 p0194 A77-27356  
Energy from agriculture  
15 p0314 A77-37664  
Improved, inexpensive solar collectors for agricultural requirements  
16 p0488 A77-49077  
Agricultural and forestry wastes as an energy resource  
16 p0489 A77-49083  
Interpretation of Pennsylvania agricultural land use from ERTS-1 data  
[E77-10111] 14 p0215 N77-18525  
Clean fuels from agricultural and forestry wastes  
[PB-259956/1] 14 p0233 N77-20610  
Choosing an electrical energy future for the Pacific northwest: An alternative scenario  
[PB-264048/0] 15 p0375 N77-25674  
Systems study of fuels from sugarcane, sweet sorghum, sugar beets, and corn  
[TID-27336] 15 p0377 N77-26324  
Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164] 15 p0383 N77-26675  
Research on the application of solar energy to the food drying industry  
[PB-267210/3] 16 p0530 N77-30635
- AIR**  
A design procedure for solar air heating systems  
16 p0480 A77-49006  
Design procedure for solar air heating systems  
[CONF-760842-14] 16 p0514 N77-28589

# AIR CARGO

# SUBJECT INDEX

## AIR CARGO

Flight test development of a helicopter-towed surface delivery system 15 p0317 A77-38006

## AIR CONDITIONING

Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system 13 p0020 A77-12665

Cooling arrays of circuit cards using heat pipes and forced air diffusers 13 p0031 A77-12766

A unique Rankine-cycle heat pump system 13 p0036 A77-12799

Thermal energy storage for heating and air conditioning 13 p0057 A77-16206

Solar-powered housing unit - Simulation of solar heating and cooling in Saudi Arabia 13 p0078 A77-19110

Combined solar and petroleum energy HVAC system for a commercial building in Dhahran --- Heating, Ventilating and Air Conditioning 13 p0078 A77-19111

Preliminary design data for a solar house in Riyadh, Saudi Arabia 13 p0078 A77-19112

A comparison of solar absorption air conditioning systems 14 p0158 A77-22647

Solar absorption air-conditioning performance in central Ohio 14 p0168 A77-23443

Relationship between heat source temperature, heat sink temperature and coefficient of performance for solar-powered absorption air conditioners 14 p0168 A77-23446

Absorption cycles for air-cooled solar air conditioning 14 p0168 A77-23447

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Seattle, Wash., June 27-July 1, 1976, Proceedings 14 p0170 A77-23651

Operational modes of solar heating and cooling systems 14 p0180 A77-25899

Design of a solar heating and cooling system for CSU Solar House II 14 p0181 A77-25902

Continuous solar air conditioning with ammonia/water absorption cycle 14 p0182 A77-26057

The University of Florida solar house 15 p0294 A77-35317

Solar cooling of a Florida welcome station - A demonstration 15 p0294 A77-35319

Cool it, sun --- space heating and cooling 15 p0305 A77-36627

Geothermal heat - instead of electrically powered compression - proposed for cooling a small residence or office building 15 p0335 A77-39818

Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552

Aerospace and HVAC&R: Spinoff '77 - Reaping the dividends --- Heating, Ventilation, Air Conditioning, and Refrigeration 16 p0427 A77-45918

The test reference year: A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun --- for heating and air conditioning systems design 16 p0441 A77-48258

The design of a sodium sulfate decahydrate heat exchanger for coolness storage --- in solar-powered air conditioning system 16 p0450 A77-48760

The Page-Jackson Elementary School solar heating and cooling system 16 p0462 A77-48851

The current technology for solar heating and cooling 16 p0470 A77-48919

Parametric study of a dynamic solar powered absorption cycle 16 p0475 A77-48961

Modelling of a solar-operated absorption air conditioner system with refrigerant storage 16 p0475 A77-48963

Steady-state and transient performance limitations of the ARKLA Solar absorption cooling system 16 p0478 A77-48987

The solar fan - Solar induced draft air conditioning system 16 p0478 A77-48988

Solar air conditioning applications for warm humid climate 16 p0496 A77-49147

Solar hot water systems application to the solar building test facility and the Tech House 13 p0084 N77-10342

CCMS solar energy pilot study solar heating and cooling systems in buildings [UMD-4908-5] 13 p0088 N77-10657

A location matrix plan for the residential solar heating and cooling demonstration program. Volume 1: Findings and recommendations [PB-253784/3] 13 p0089 N77-10673

Hybrid simulation of solar HVAC system for house retro-fit design [PB-252608/5] 13 p0090 N77-10676

National program for solar heating and cooling (residential and commercial applications) [ERDA-23A] 13 p0098 N77-11540

Temperature distribution of a hot water storage tank in a simulated solar heating and cooling system [NASA-TM-X-73549] 13 p0106 N77-12521

Evaluation of the air-to-air heat pump for residential space conditioning [PB-255652/0] 13 p0108 N77-12545

The design of a solar energy collection system to augment heating and cooling for a commercial office building [NASA-TM-X-72753] 14 p0207 N77-16446

Optimization of absorption air-conditioning for solar energy applications [NASA-CR-150176] 14 p0210 N77-17560

Potential environmental impacts of solar heating and cooling systems [PB-259970/2] 14 p0226 N77-19683

General Electric Company proposed management plan, commercial buildings, National Solar Demonstration Program [COO-2683-76-3] 14 p0229 N77-20568

General Electric Company proposed demonstration Projects Matrix, commercial buildings, National Solar Demonstration Program [COO-2683-76-5] 14 p0230 N77-20569

Proposed management plan, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-8] 14 p0230 N77-20570

Proposed test and evaluation plan, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-9] 14 p0230 N77-20571

Proposed demonstration Projects Matrix, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-10] 14 p0230 N77-20572

Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 1: Solar heating and cooling of buildings [PB-260594/7] 14 p0252 N77-21121

A location matrix plan for the residential solar heating and cooling demonstration program. Volume 2: Procedures and appendices [PB-262646/3] 15 p0374 N77-25666

Evaluation of initial collector field performance at the Langley Solar Building Test Facility [NASA-TM-X-73677] 15 p0378 N77-26617

Comparative performance of solar heating with air liquid systems [COO-2868-1] 15 p0383 N77-26676

National program plan for research and development in solar heating and cooling [ERDA-76-144] 16 p0514 N77-28597

National program for solar heating and cooling of buildings [ERDA-76-6] 16 p0515 N77-28604

- Energy conservation on campus. Volume 2: Case studies  
[PB-266212/0] 16 p0524 N77-29637
- Economic analysis of solar water and space heating  
[DSE/2322-1-SUPPL] 16 p0536 N77-31627
- Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems  
[PB-267832/4] 16 p0554 N77-33618
- Strategies for commercializing customer thermal-energy storage  
[ANI-ES-55] 16 p0557 N77-33649
- AIR CONDITIONING EQUIPMENT**
- The assurance of the heat supply with respect to the primary energy use in the case of heating and air conditioning installations  
13 p0009 A77-11270
- Experimental evaluation of the University of Florida solar powered ammonia/water absorption air conditioning system  
13 p0039 A77-12823
- Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data  
13 p0039 A77-12824
- Optimizing solar cooling systems  
13 p0047 A77-13502
- Energy and environmental considerations in extending heat pump applications  
13 p0062 A77-17058
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Semiannual Meeting, Dallas, Tex., February 1-5, 1976, Proceedings  
14 p0167 A77-23438
- Solar powered absorption cycle simulation using real and stochastic weather data  
[ASME PAPER 76-WA/SOL-6] 14 p0188 A77-26511
- Cooling with solar energy  
15 p0268 A77-32401
- Possibilities for the solar air conditioning of buildings  
15 p0335 A77-39978
- Light commercial Brayton/Rankine space conditioning system  
16 p0445 A77-48716
- Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures --- compatible with flat-plate solar collectors  
16 p0475 A77-48962
- A solar heated and cooled office building  
16 p0475 A77-48966
- Solar assisted heat pump air conditioning system  
16 p0477 A77-48985
- Solar retrofit applications for public buildings  
16 p0479 A77-48997
- Solar powered absorption air-conditioning system performance using real and synthetic weather data  
16 p0479 A77-49002
- Initial operation of a solar heating and cooling system in a full-scale solar building test facility  
16 p0498 A77-49164
- Measured performance of a 3 ton Libr absorption water chiller and its effect on cooling system operation  
[NASA-TN-Y-73496] 13 p0105 N77-12518
- Method for estimating solar heating and cooling system performance  
[AD-A026041] 13 p0116 N77-13557
- Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
[PB-257770/8] 14 p0208 N77-16452
- Development of the ice-maker heat pump  
[CONF-760618-2] 14 p0223 N77-19624
- Design, construction, and testing of a residential solar heating and cooling system  
[COO-2577-10] 14 p0248 N77-21670
- Optimization studies of solar absorption air conditioning systems  
[NSF/RANN/SE/GI-39117/PB-76/2] 14 p0250 N77-21690
- Experimental results for a heat pump system with thermal storage  
[COO-2704-3] 14 p0250 N77-21697
- Solar energy government buildings program policy and implementation plan  
[PB-262841/0] 15 p0366 N77-24622
- AIR COOLING**
- Cooling arrays of circuit cards using heat pipes and forced air diffusers  
13 p0031 A77-12766
- A 2-MW electric arc generator with porous cooling of the interelectrode insert  
13 p0049 A77-13831
- Absorption cycles for air-cooled solar air conditioning  
14 p0168 A77-23447
- Initial test results for a solar-cooled townhouse in the mid-Atlantic region  
14 p0170 A77-23655
- ERDA/PENA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology  
16 p0446 A77-48721
- Performance of air-cooled flat plate collectors  
16 p0472 A77-48942
- Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures --- compatible with flat-plate solar collectors  
16 p0475 A77-48962
- Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling  
[NASA-CR-150032] 13 p0086 N77-10638
- AIR FLOW**
- Field experiment of in-situ oil recovery from a Utah tar sand by reverse combustion  
14 p0193 A77-27348
- 10 design principles for air-to-air heat pumps  
16 p0408 A77-41824
- AIR NAVIGATION**
- Helicopter offshore operations --- oil and gas exploration and production  
16 p0421 A77-44437
- AIR POLLUTION**
- Evolution of atmospheric pollution /high acidity and black fumes/ in France during 1975  
13 p0002 A77-10670
- The fuel approach to control emissions from aircraft  
[IAF PAPER 76-111] 13 p0003 A77-10911
- Sulphur pollution and emission charges  
13 p0005 A77-11033
- Low-sulfur coal obtained by chemical desulfurization followed by liquefaction  
13 p0008 A77-11242
- Compilation of an inventory for particulate emissions in Belgium  
13 p0009 A77-11271
- Air cleanup and energy management  
13 p0010 A77-11302
- Clean air protection and industrial development  
13 p0010 A77-11303
- Application of the Stretford process for H<sub>2</sub>S abatement at the Geysers geothermal power plant  
13 p0029 A77-12743
- The conservation of air purity and its effect on the energy economy  
13 p0049 A77-13811
- Black magnetic spherule fallout in the eastern Gulf of Mexico  
13 p0052 A77-14890
- Aerosol formation during coal combustion - Condensation of sulfates and chlorides on flyash  
13 p0054 A77-15778
- Atmospheric ice nuclei - No detectable effects from a coal-fired powerplant plume  
13 p0054 A77-15780
- Assessing low sulfur coal resources in Montana and Wyoming  
13 p0058 A77-16374
- Production of atmospheric nitrous oxide by combustion  
13 p0061 A77-16922
- Effects of anthropogenic emissions on climate - A review of selected topics  
13 p0067 A77-18295
- Organization of long range transport of air pollution monitoring in Europe  
13 p0071 A77-18754
- General Motors Sulfate Dispersion Experiment - Assessment of the EPA HIWAY model  
13 p0071 A77-18882

Desulfurization of flue gases with iron/III/ oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions --- German book  
13 p0080 A77-19184

Composition and size distribution of in-stack particulate material at a coal-fired power plant  
14 p0139 A77-21018

United States Postal Service Electric Vehicle Program  
14 p0161 A77-22912

Reduction of atmospheric pollution due to the automobile and energy savings  
14 p0162 A77-22948

Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors  
[ASME PAPER 76-WA/FU-10] 14 p0185 A77-26457

SO2 control technologies - Commercial availabilities and economics  
14 p0191 A77-27279

Raman scattering and the characterisation of atmospheric aerosol particles  
15 p0262 A77-31487

The role of gas utilization in environmental protection  
15 p0265 A77-31849

Particle size distributions of dusts in the flue gas of power plants and in atmospheric air  
15 p0265 A77-31889

Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products  
15 p0269 A77-32506

Distribution of some hydrocarbons in ambient air near Delft and the influence on the formation of secondary air pollutants  
15 p0271 A77-32954

Possible pollution and cost analysis from wide use of hydrogen fuel in transportation  
15 p0285 A77-33422

Mercury emissions from geothermal power plants  
15 p0289 A77-34428

Automotive sulfate emissions  
15 p0290 A77-34629

Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer  
15 p0290 A77-34895

A method for evaluating SO2 abatement strategies  
15 p0293 A77-35169

Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio  
15 p0293 A77-35186

Chemical reduction of SC3, particulates and NOx emissions  
15 p0294 A77-35188

Comparative discussion on measurements of atmospheric natural radioactivity and pollution by coal smoke particles  
15 p0294 A77-35349

The interaction of automotive-engine efficiency and exhaust pollution  
15 p0296 A77-35922

Determination of SO2 concentrations from a coal-burning power plant stack by Fourier spectrometry  
15 p0296 A77-36024

EPA resource recovery demonstration - Summary of air emissions analyses  
15 p0313 A77-37630

An application of the economic-environmental power dispatch --- decision approach for controlling air pollution emission from electric power generation  
15 p0317 A77-38121

Optimization of automotive engine fuel economy and emissions  
15 p0320 A77-38373

Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79] 15 p0321 A77-38533

Can we control the carbon dioxide in the atmosphere  
15 p0322 A77-38674

Fuel conversion strategy impacts on compliance with photochemical oxidant standards  
15 p0333 A77-39585

Emission and deposition of petrol engine exhaust Pb. I - Deposition of exhaust Pb to plant and soil surfaces  
15 p0333 A77-39655

Hydrogen peroxide emission levels from a hydrogen fueled combustion engine  
16 p0399 A77-40644

Tropospheric oxidation H2S  
16 p0411 A77-42254

Energy reduction in cleaning exhausts containing particulates and noxious gases  
16 p0414 A77-42740

Control of air pollution sources --- Book  
16 p0419 A77-43522

Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants  
16 p0420 A77-44178

Catalytic action of combustion-product deposits in the oxidation of SO2 to SO3 within the combustion chambers and exhaust channels of thermoelectric plants  
16 p0420 A77-44179

Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine  
16 p0444 A77-48706

Exhaust and evaporative emission from a Brazilian Chevrolet fueled with ethanol-gasoline blends  
16 p0444 A77-48708

Pollution control in geothermal energy  
16 p0452 A77-48772

Impact of air quality regulation on the electric power industry  
16 p0452 A77-48775

Power generation: Air pollution monitoring and control --- Book  
16 p0504 A77-51126

Eliminate source emission codes for coal-refuse fired power plants  
16 p0504 A77-51128

Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station  
16 p0504 A77-51135

Air pollution control for industrial coal-fired boilers  
16 p0504 A77-51152

Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite  
16 p0508 A77-51587

A 1977 approach to sulfur oxide emissions [ASME PAPER 77-JPGC-PWR-1] 16 p0508 A77-51621

Protocol to characterize gaseous emissions as a function of fuel and additive composition [PB-253363/6] 13 p0084 A77-10221

Fuels and fuel additives for highway vehicles and their combustion products. Guide to evaluation of their potential effects on health [PB-254088/8] 13 p0084 A77-10222

Mathematical simulation and empirical determination of the aerochemical and thermal atmospheric pollution resulting from energy conversion processes [DLR-IB-553-75/1] 13 p0091 A77-10700

The proceedings of the NOx Control Technology Seminar [PB-253661/3] 13 p0092 A77-10707

Growth effects of major land use projects. Volume 2: Compilation of land use based emission factors [PB-255302/2] 13 p0092 A77-10709

Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere [PB-253375/0] 13 p0092 A77-10715

Cost analysis of two air quality attainment strategies [PB-254182/9] 13 p0092 A77-10719

The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California [PB-254449/2] 13 p0092 A77-10720

Reductant gases for flue gas desulfurization systems [PB-254168/8] 13 p0092 A77-10722

Compilation of air pollutant emission factors. Supplement [PB-254274/4] 13 p0093 A77-10731

- Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization [PB-254466/2] 13 p0101 N77-11581
- An evaluation of high altitude engine modification devices (econo-kit) [PB-255556/3] 13 p0101 N77-11589
- Investigation and assessment of light-duty-vehicle evaporative emission sources and control [PB-255813/8] 13 p0102 N77-11603
- A bioenvironmental study of emissions from refuse derived fuel [AD-A024661] 13 p0110 N77-12571
- Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576
- Laws and regulations affecting coal with summaries of Federal, State, and local laws and regulations pertaining to air and water pollution control, reclamation, diligence and health and safety, part 1 [PB-255927/6] 13 p0110 N77-12592
- Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB-255317/0] 13 p0110 N77-12597
- Laboratory analysis of solvent refined coal [PB-255550/6] 13 p0110 N77-12598
- Automotive gas turbine fuel control [NASA-CASE-LEW-12785-1] 13 p0113 N77-13426
- Burner design criteria for control of NOx from natural gas combustion. Volume 2: Raw data and experimental results [PB-256806/1] 13 p0115 N77-13549
- Proceedings of the Stationary Source Combustion Symposium. Volume 1. Fundamental research [PB-256320/3] 13 p0116 N77-13569
- Proceedings of the Stationary Source Combustion Symposium. Volume 2. Fuels and process research and development [PB-256321/1] 13 p0116 N77-13570
- Evaluation of pollution control in fossil fuel conversion processes [PB-255842/7] 13 p0125 N77-14638
- Proceedings of the Stationary Source Combustion Symposium. Volume 3: Field Testing and Surveys [PB-257146/1] 13 p0125 N77-14643
- Second Environmental Aspects of Fuel Conversion Technology Symposium [PB-257182/6] 13 p0125 N77-14645
- Hot fuel gas desulfurization [PB-257036/4] 13 p0133 N77-15539
- Performance of emission control devices on boilers firing municipal solid waste and oil [PB-257136/2] 13 p0133 N77-15550
- Fuel gas environmental impact [PB-257134/7] 14 p0209 N77-16470
- Combustion rates and mechanisms of pulverized coals and coal-derived fuels [SAND-76-8229] 14 p0224 N77-19638
- Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames [PB-259911/6] 14 p0234 N77-20639
- Possible pollution and cost analysis from wide use of hydrogen fuel in transportation 14 p0247 N77-21664
- Operation cough drop 14 p0247 N77-21665
- Environmental research needs for coal conversion and combustion technologies [PB-262159/7] 15 p0347 N77-22659
- Control of oxides of sulfur from stationary sources in the south coast air basin of California [PB-261754/6] 15 p0348 N77-22668
- Technology and economics of flue gas NOx oxidation by ozone [PB-261917/9] 15 p0350 N77-22700
- Initial environmental test plan for source assessment of coal gasification [PB-261916/1] 15 p0350 N77-22705
- Size distribution and mass output of particulates from diesel engine exhausts [PB-261416/2] 15 N77-22732
- The 1975 automotive characteristics data base [PB-262015/1] 15 p0354 N77-23507
- Combustion additives for pollution control: A state-of-the-art review [PB-264068/8] 15 p0359 N77-24316
- PCB emissions from stationary sources: A theoretical study [PB-262850/1] 15 p0367 N77-24665
- Vapor recovery analysis [PB-262846/9] 15 p0368 N77-24667
- Development of procedures for the measurement of fugitive emissions [PB-263992/0] 15 p0368 N77-24671
- Effect of automotive parts on vehicle and engine emissions. Phase 1: Original equipment [PB-264057/1] 15 p0368 N77-24672
- Survey of emissions control and combustion equipment data in industrial process heating [PB-263453/3] 15 p0368 N77-24674
- Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks [PB-262789/1] 15 p0371 N77-25551
- Energy requirements for air pollution control in the primary aluminum industry [PB-264483/9] 15 p0375 N77-25684
- Measurement of dry deposition of fossil fuel plant pollutants [PB-264495/3] 15 p0376 N77-25685
- Air pollution and the siting of fossil fuel power plants [ANI-76-XX-14] 15 p0386 N77-26708
- Comparison of calculated and measured maximum aboveground air pollutant concentrations and their respective distances from the source of release of large power plants [ORNL-TB-4231] 15 p0386 N77-26712
- Modeling the atmospheric dispersal of radioactive pollutants beyond the first few hours of travel [PB-264495/3] 15 p0395 N77-27603
- Report of the Hearing Panel: National Public hearing on Power Plant Compliance with Sulfur Oxide Air Pollution Regulations [PB-264891/3] 15 p0396 N77-27625
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model [PB-264822/8] 16 p0517 N77-28628
- Evaluation of molten scrubbing for fine particulate control [PB-266092/6] 16 p0517 N77-28642
- EPA and ERDA high-temperature/high-pressure particulate control programs [PB-266231/0] 16 p0517 N77-28644
- Design of minimum-weight diffusion batteries [PB-266217/9] 16 p0518 N77-28645
- Environmental effects of energy production and utilization in the US. Volume 1: Sources, trends and costs of control [UCRL-51930-VOL-1] 16 p0530 N77-30645
- Dimensions. Volume 61, number 3 --- with emphasis on air pollution control [PB-266997/6] 16 p0531 N77-31019
- Automobile emission control. The development status, trends, and outlook as of December 1976 [PB-267865/4] 16 p0540 N77-31685
- Automobile emission control: Technological approaches toward improving in-use vehicle emissions performance [PB-267537/9] 16 p0544 N77-32508
- In-situ coal gasification: Status of technology and environment impact [PB-268576/6] 16 p0548 N77-32613
- Study of gasoline vapor emission controls at small bulk plants [PB-267096/6] 16 p0549 N77-32638
- Reliability study of vapor recovery systems at service stations [PB-267613/8] 16 p0560 N77-33700
- AIR PURIFICATION**
- Flue gas desulfurization experience 14 p0136 A77-20381
- Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407
- AIR QUALITY**
- The conservation of air purity and its effect on the energy economy 13 p0049 A77-13811
- Fuel conversion strategy impacts on compliance with photochemical oxidant standards 15 p0333 A77-39585

# AIR SAMPLING

# SUBJECT INDEX

Northeastern utilities are meeting the clean air challenge  
16 p0424 A77-44612

Cost analysis of two air quality attainment strategies  
[PB-254182/9] 13 p0092 N77-10719

The air quality and economic implications of supplementary control systems in Illinois --- considering electric power plant fuels  
[PB-255699/1] 13 p0101 N77-11588

## AIR SAMPLING

Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station  
16 p0504 A77-51135

Initial environmental test plan for source assessment of coal gasification  
[PB-261916/1] 15 p0350 N77-22705

Environmental assessment sampling and analytical strategy program --- industrial wastes  
[PB-261259/6] 15 p0352 N77-23021

## AIR TO AIR MISSILES

Performance optimization of an air-to-air missile design  
15 p0289 A77-34298

## AIR TRAFFIC CONTROL

LH2 airport requirements study  
[NASA-CR-2700] 13 p0083 N77-10032

Report to congress by the Federal Aviation Administration on the energy efficiency of agency regulations  
[AD-A034611] 15 p0359 N77-24103

## AIR TRANSPORTATION

Air transportation energy efficiency - Alternatives and implications  
[SAWE PAPER 1124] 13 p0016 A77-12192

Transport of the future and the tasks of science  
13 p0048 A77-13643

Air transportation and fuel consumption  
13 p0051 A77-14563

LTA - Recent developments --- Lighter Than Air ships  
13 p0061 A77-17021

Regulatory reform of air transportation  
[AIAA PAPER 77-276] 13 p0065 A77-18215

The future of air transportation - Economic association considerations  
[AIAA PAPER 77-286] 13 p0065 A77-18222

Our amazing air transportation system /AIAA-SAE William Littlewood Memorial Lecture/ --- civil aviation aircraft historical overview  
[AIAA PAPER 77-356] 13 p0067 A77-18260

Effects of selected R&D options on fuel usage in the commercial air system  
14 p0201 A77-29472

Report on Joint Conference Eno Foundation Board of Directors and Board of Consultants, October 13 and 14, 1976  
15 p0260 A77-31064

Some early perspectives on ground requirements of liquid hydrogen air transports  
15 p0281 A77-33391

Flight test development of a helicopter-towed surface delivery system  
15 p0317 A77-38006

Have energy, will travel --- alternative aviation energy sources in the future  
16 p0409 A77-41933

Competitive restraints on air travel - Ground modes and telecommunications  
16 p0409 A77-41939

A view of the future - Constraints and opportunities --- aviation effects on world structure  
16 p0410 A77-41944

The aircraft energy efficiency active controls technology program  
[AIAA 77-1076] 16 p0415 A77-42784

Baseline energy forecasts and analysis of alternative strategies for airline fuel conservation  
[PB-255351/9] 13 p0091 N77-10690

Future aircraft requirements: A notebook of airline thoughts  
13 p0117 N77-13976

Air transport propulsion for the 1980's  
13 p0117 N77-13980

Air transportation beyond the 1980's  
13 p0117 N77-13984

Domestic and world trends (1980 - 2000) affecting the future of aviation  
[NASA-CR-144838] 13 p0126 N77-14981

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137926] 13 p0126 N77-15007

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137927] 13 p0126 N77-15008

Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis  
[NASA-CR-137923] 15 p0353 N77-23072

Factors affecting the corporate decisionmaking process of air transport manufacturers  
[NASA-CR-154618] 15 p0387 N77-27020

## AIRBORNE EQUIPMENT

LTA - Recent developments --- Lighter Than Air ships  
13 p0061 A77-17021

Tracking pollutants from a distance  
13 p0067 A77-18370

## AIRBORNE/SPACEBORNE COMPUTERS

Power supplies for full time fly-by-wire aircraft control systems  
15 p0320 A77-38461

## AIRCRAFT CONFIGURATIONS

The next-generation subsonic transport  
[SAWE PAPER 1127] 13 p0016 A77-12195

## AIRCRAFT CONSTRUCTION MATERIALS

Composite technology - The boom is under way --- rotorcraft materials  
15 p0287 A77-33616

## AIRCRAFT CONTROL

Power supplies for full time fly-by-wire aircraft control systems  
15 p0320 A77-38461

## AIRCRAFT DESIGN

Estimating procedures associated with aircraft modifications  
[SAWE PAPER 1101] 13 p0016 A77-12181

Application of advanced technology to future long-range aircraft  
[SAWE PAPER 1126] 13 p0016 A77-12194

The next-generation subsonic transport  
[SAWE PAPER 1127] 13 p0016 A77-12195

Hypersonic technology-approach to an expanded program  
13 p0051 A77-14597

Layout and flight performance of a hypersonic transport /HST/  
[DGLR PAPER 76-198] 13 p0060 A77-16575

Technical highlights in general aviation  
[AIAA PAPER 77-312] 13 p0066 A77-18237

Our amazing air transportation system /AIAA-SAE William Littlewood Memorial Lecture/ --- civil aviation aircraft historical overview  
[AIAA PAPER 77-356] 13 p0067 A77-18260

The pay-off for advanced technology in commercial aircraft design and operation  
13 p0071 A77-19012

The dynamics of STOL /The Daniel and Florence Guggenheim Lecture/ --- utility aircraft for short haul service in remote areas  
[ICAS PAPER 76-01] 13 p0081 A77-19247

Energy and economic trade offs for advanced technology subsonic aircraft  
14 p0201 A77-29471

Fundamentals of aerodynamic design: Propellers /2nd enlarged edition/ --- Serbo-Croatian book  
15 p0317 A77-37949

Evaluation of propulsive lift enhancement and variable cycle engines for advanced tactical aircraft  
[AIAA PAPER 77-885] 15 p0321 A77-38575

Design of a large span-distributed load flying-wing cargo airplane  
[NASA-TN-X-74031] 15 p0353 N77-23089

Innovative Aircraft Design Study (IADS) task 2, volume 1  
[AD-A041234] 16 p0531 N77-31141

An overview of concepts for aircraft drag reductions  
16 p0543 N77-32092

## AIRCRAFT ENGINES

Equation solution accuracy in calculating jet engine characteristics  
13 p0020 A77-12502

# SUBJECT INDEX

# AIRCRAFT FUELS

Application of simulation studies to the design and improvement of fuel control systems for aviation turbine engines 13 p0054 A77-15798

Pressure ratio optimization criteria in aircraft turbojet-engines design 13 p0062 A77-17258

Variable geometry for high performance aircraft engines 13 p0062 A77-17264

A combined-cycle with a partial-oxidation reactor 13 p0062 A77-17534

Theoretical aspects of optimization of aviation gas turbine engine design variables 13 p0063 A77-17762

Air transport propulsion for the 1980's 14 p0138 A77-20717

The propulsion system of the aircraft Z-37. I 14 p0156 A77-22121

An engine designer's view for advanced secondary power systems [AIAA PAPER 77-517] 14 p0174 A77-23931

Piat petrol engine performance with a mixture of basil extract with petrol 14 p0179 A77-25196

Influence of the intended use of an aircraft on the optimal parameters of gas-turbine power plants 15 p0266 A77-32086

Future propulsion plants. I 15 p0268 A77-32251

Automotive engines - A viable alternative for aircraft [SAE PAPER 770466] 15 p0310 A77-37084

The M-14P aircraft engine --- Russian book 15 p0320 A77-38300

Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79] 15 p0321 A77-38533

Evaluation of propulsive lift enhancement and variable cycle engines for advanced tactical aircraft [AIAA PAPER 77-885] 15 p0321 A77-38575

Advanced supersonic transport propulsion requirements [AIAA PAPER 77-831] 16 p0410 A77-41969

Testing the annular combustor of the NK-8 aero-engine on natural gas --- for stationary gas turbine installation 16 p0426 A77-45325

Bosch technical instruction. Gasoline injection D and L-jetronic [NASA-TT-P-17111] 13 p0095 A77-11399

Auxiliary power system for activity cooled aircraft [NASA-CASE-LAR-11626-1] 13 p0103 A77-12332

Cost/benefit assessment of the application of composite materials to subsonic commercial transport engines [NASA-TN-X-73557] 13 p0111 A77-13064

Air transport propulsion for the 1980's 13 p0117 A77-13980

Study of unconventional aircraft engines designed for low energy consumption [NASA-CR-135136] 13 p0127 A77-15043

Aircraft power supplies and cooling problems: A viewpoint from the power conditioner designer 14 p0207 A77-16039

Variable Geometry and Multicycle Engines [AGARD-CP-205] 15 p0339 A77-22112

Advanced engine design concepts and their influence on the performance of multi-role combat aircraft 15 p0339 A77-22116

Variable cycle engines for V/STOL fighters 15 p0339 A77-22117

Variable cycle engine applications and constraints --- for commercial and military (fighter) aircraft 15 p0339 A77-22125

High efficiency engine cycles for air transport fuel economy 15 p0339 A77-22126

Multi-mission uses for prop-fan propulsion 15 p0339 A77-22127

The pros and cons of variable geometry turbines 15 p0340 A77-22140

Potential improvements in engine performance using a variable geometry turbine 15 p0340 A77-22141

Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 A77-26134

AIRCRAFT EQUIPMENT

Electrochemical battery trends for aircraft and missile applications [AIAA PAPER 77-481] 14 p0172 A77-23901

Development of nickel-zinc batteries for aircraft 14 p0195 A77-28148

A study of the failure of joints in composite material fuel cells due to hydraulic ram loading [AD-A027258] 13 p0117 A77-14016

AIRCRAFT FUEL SYSTEMS

The fuel approach to control emissions from aircraft [IAF PAPER 76-111] 13 p0003 A77-10911

The technical concept of the IL-62M. II - Fuel system 14 p0156 A77-22120

The M-14P aircraft engine --- Russian book 15 p0320 A77-38300

National Airlines Fuel Management and Allocation Model 16 p0419 A77-43399

Aircraft fuel conservation technology. Task force report, September 10, 1975 [NASA-TN-X-74295] 13 p0093 A77-11055

Reduction of gaseous pollutant emissions from gas turbine combustors using hydrogen-enriched jet fuel [NASA-CR-149146] 13 p0094 A77-11198

Fuel subsystem characteristics for LH2 aircraft 14 p0243 A77-21630

AIRCRAFT FUELS

Air transportation energy efficiency - Alternatives and implications [SAE PAPER 1124] 13 p0016 A77-12192

Survey of hydrogen energy application projects 13 p0033 A77-12778

Air transportation and fuel consumption 13 p0051 A77-14563

Liquid hydrogen as propellant for commercial aircraft [DGLR PAPER 76-188] 13 p0059 A77-16534

Fuel consumption of civil jet transport aircraft 13 p0062 A77-17234

Regulatory reform of air transportation [AIAA PAPER 77-276] 13 p0065 A77-18215

Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids 14 p0145 A77-21623

The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0171 A77-23718

Some early perspectives on ground requirements of liquid hydrogen air transports 15 p0281 A77-33391

New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392

Fuel subsystem characteristics for LH2 aircraft 15 p0281 A77-33393

Aviation turbine fuels from shale and coal oils 15 p0291 A77-35150

Have energy, will travel --- alternative aviation energy sources in the future 16 p0409 A77-41933

The aircraft energy efficiency active controls technology program [AIAA 77-1076] 16 p0415 A77-42784

The military utility of very large airplanes and alternative fuels 16 p0434 A77-47271

Alternate fuels for future aircraft 16 p0444 A77-48709

The liquid hydrogen option for the subsonic transport - A status report 16 p0458 A77-48819

Hydrogen-fueled subsonic aircraft: A perspective 13 p0084 A77-10344

The potential of liquid hydrogen as a military aircraft fuel [AD-A026666] 13 p0118 A77-14272

Alternative fuels for aviation [GPO-78-544] 13 p0127 A77-15212

Aircraft fuel efficiency program [S-REP-94-633] 14 p0209 A77-17032

- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0243 N77-21627
- Some early perspectives on ground requirements of liquid hydrogen air transports 14 p0243 N77-21628
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 14 p0243 N77-21629
- Examination of the costs, benefits and energy conservation aspects of the NASA aircraft fuel conservation technology program [NASA-CR-152683] 15 p0352 N77-23007
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis [NASA-CR-137923] 15 p0353 N77-23072
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses [NASA-CR-137924] 15 p0353 N77-23073
- Alternate aircraft fuels: Prospects and operational implications [NASA-TM-X-74030] 16 p0511 N77-28322
- Estimation of net enthalpies of combustion of some aviation fuels expressed in the international system of units (SI) [NBS-TN-937] 16 p0550 N77-33370
- AIRCRAFT INDUSTRY**
- Air transportation beyond the 1980's 13 p0117 N77-13984
- Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618] 15 p0387 N77-27020
- AIRCRAFT MAINTENANCE**
- Fuel conservation through airplane maintenance 16 p0427 A77-45925
- AIRCRAFT MANEUVERS**
- Energy-turn-rate characteristics and turn performance of an aircraft 15 p0265 A77-31855
- AIRCRAFT NOISE**
- Development of cumulative noise measure for the prediction of general annoyance in an average population 15 p0320 A77-38497
- AIRCRAFT PERFORMANCE**
- Concorde - Endurance flights results 13 p0016 A77-12114
- Layout and flight performance of a hypersonic transport /HST/ [DGLR PAPER 76-198] 13 p0060 A77-16575
- A simplified method in flight test techniques for the determination of the range performance of jet aircraft 13 p0060 A77-16600
- Energy-turn-rate characteristics and turn performance of an aircraft 15 p0265 A77-31855
- Energy utilization factor in civil transport aircraft 15 p0307 A77-36788
- Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft [SAE PAPER 770470] 15 p0310 A77-37088
- AIRCRAFT PRODUCTION**
- Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618] 15 p0387 N77-27020
- AIRCRAFT STRUCTURES**
- Advanced helicopter structural design investigation. Volume 1: Investigation of advanced structural component design concepts [AD-A024662] 13 p0102 N77-12052
- AIRFOIL PROFILES**
- A new series of aerofoil sections suitable for aircraft propellers 15 p0298 A77-36157
- The effect of aerofoil characteristics on windmill performance 16 p0438 A77-47880
- Comparative wind tunnel investigation of sail profiles for windmills [VTH-191] 13 p0111 N77-13012
- AIRFOILS**
- Analysis of the wind-driven reciprocator 14 p0183 A77-26088
- AIRLINE OPERATIONS**
- The future of air transportation - Economic association considerations [AIAA PAPER 77-286] 13 p0065 A77-18222
- Our amazing air transportation system /AIAA-SAE William Littlewood Memorial Lecture/ --- civil aviation aircraft historical overview [AIAA PAPER 77-356] 13 p0067 A77-18260
- The pay-off for advanced technology in commercial aircraft design and operation 13 p0071 A77-19012
- The seat belt light is on --- airline industry economic assessment and forecasts 13 p0080 A77-19175
- Some early perspectives on ground requirements of liquid hydrogen air transports 15 p0281 A77-33391
- A view of the future - Constraints and opportunities --- aviation effects on world structure 16 p0410 A77-41944
- National Airlines Fuel Management and Allocation Model 16 p0419 A77-43399
- Air New Zealand's methods of flying the DC-10 [AIAA PAPER 77-1255] 16 p0421 A77-44343
- An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports [NASA-CR-2699] 13 p0083 N77-10033
- Aviation economics --- commercial airlines [GPO-73-830] 15 p0352 N77-23008
- AIRPORT LIGHTS**
- Emergency power plant of rapid availability for the Berlin-Tegel airport 13 p0001 A77-10324
- AIRPORT PLANNING**
- Electric power supply in the case of airports. I [NASA-CR-2700] 13 p0061 A77-16742
- LH2 airport requirements study [NASA-CR-2700] 13 p0083 N77-10032
- AIRPORTS**
- Some early perspectives on ground requirements of liquid hydrogen air transports 14 p0243 N77-21628
- AIRSHIPS**
- Ultralightweight solar array for Naval Sea Control Systems 13 p0040 A77-12828
- LTA - Recent developments --- Lighter Than Air ships 13 p0061 A77-17021
- ALASKA**
- Clean energy from Alaskan coals 15 p0301 A77-36333
- The exploration, development and production of Naval petroleum reserve number 4 [PB-256714/7] 13 p0113 N77-13516
- Heat pipes for the trans-Alaska pipeline 13 p0120 N77-14388
- Geothermal Energy and Wind Power: Alternate energy sources for Alaska [PB-261521/9] 15 p0349 N77-22678
- Study of Alaskan wind power and its possible applications [NSF/RANN/SE/AER74-00239/PB-26] 15 p0382 N77-26664
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 1 [PB-264705/5] 15 p0383 N77-26677
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2 [PB-264706/3] 15 p0385 N77-26693
- Alaska OCS socioeconomic studies program, literature survey [PB-269244/0] 16 p0549 N77-32681
- ALCOHOLS**
- Survey of alcohol fuel technology, volume 1 [PB-256007/6] 13 p0112 N77-13232
- Survey of alcohol fuel technology, volume 2 [PB-256008/4] 13 p0112 N77-13233
- An evaluation of methanol, ethanol, the propanols, and the butanols as ship propulsion fuels [AD-A033483] 15 p0354 N77-23277
- ALPAPA**
- Interpretation of Pennsylvania agricultural land use from ERTS-1 data [E77-10111] 14 p0215 N77-18525



- ALGAE**  
 Bioconversion of solar energy in salt water photosynthetic hydrogen production systems 15 p0278 A77-33369  
 Gas production from micro algae 15 p0314 A77-37665  
 The photosynthesis energy factory - Analysis, synthesis, and demonstration 16 p0449 A77-48753  
 Hydrocarbon fuels from solar energy via the alga *Botryococcus brauni* [ARL/MECH-ENG-148] 16 p0513 A77-28576
- ALGORITHMS**  
 Modeling algorithms and their implementation on a digital computer for calculating the capacity of storage cells at wind-power and solar energy installations 15 p0316 A77-37775  
 Simulation algorithms and their realization by digital computer for calculation of wind- and solar-plant storage-service capacity 16 p0437 A77-47431
- ALKALI METALS**  
 Alkali metal space power technology applicable to national energy research and development [AIAA PAPER 77-289] 13 p0065 A77-18223  
 Some features of start-up of alkali metal heat pipes 13 p0119 A77-14383
- ALKALIES**  
 Air electrodes for H<sub>2</sub>-air fuel cells with alkali electrolyte 13 p0065 A77-18196
- ALKALINE BATTERIES**  
 Recent developments of large electrolytic hydrogen generators 15 p0277 A77-33358  
 Porous electrodes for Zn/air alkaline battery 16 p0431 A77-46722  
 Evaluation of potassium titanate as a component of alkaline fuel cell matrices [NASA-TN-D-8341] 13 p0094 A77-11175  
 New separators for nickel-zinc batteries [NASA-TN-X-3465] 13 p0121 A77-14585
- ALKANES**  
 Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262
- ALKENES**  
 Environmental considerations of selected energy conserving manufacturing process options. Volume 6: Olefins industry report [PB-264272/6] 15 p0384 A77-26683
- ALLOCATIONS**  
 Analysis and forecast of electrical distribution system materials. Volume 3: Appendix [CONS/2050-1-VOL-3-APP] 16 p0551 A77-33430
- ALLOYS**  
 A simple approach to metal hydride alloy optimization 15 p0281 A77-33388  
 Metalhydrides [OUEL-1146/76] 13 p0094 A77-11158  
 Materials research and evaluation for geothermal corrosion environments --- alloys [COO-2602-2] 14 p0210 A77-17216  
 A simple approach to metal hydride alloy optimization 14 p0243 A77-21624  
 Hydrogen sulfide stress corrosion cracking in materials for geothermal power [COO-2576-3] 16 p0519 A77-29269
- ALLUVIUM**  
 Alluvial valley floors in east-central Montana and their relation to strippable coal reserves. A reconnaissance report [PB-267280/6] 16 p0540 A77-31725
- ALTERNATING CURRENT**  
 Studies of helical conductor models for superconducting ac power transmission [BNL-21784] 14 p0236 A77-21332
- ALUMINUM**  
 Lithium-aluminum/metal sulfide batteries [AIAA PAPER 77-483] 14 p0172 A77-23903  
 Corrosion prevention in aluminum solar systems 15 p0270 A77-32602  
 Corrosion problems in solar energy systems 15 p0270 A77-32603
- Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors 16 p0418 A77-43049
- ALUMINUM-BASED ANODES FOR UNDERWATER FUEL CELLS:**  
 A phase report [AD-A026405] 13 p0131 A77-15512
- EXPERIMENTAL STUDY OF THE THEORETICAL AND TECHNOLOGICAL POSSIBILITIES TO MANUFACTURE SOLAR CELLS USING GALLIUM-LAYERS ON GAA-S-STRUCTURES**  
 [BMFT-FB-W-76-10] 14 p0212 A77-17584
- A 100-KW METAL WIND TURBINE BLADE BASIC DATA, LOADS AND STRESS ANALYSIS**  
 [NASA-CR-134956] 14 p0236 A77-21467
- ENERGY REQUIREMENTS FOR AIR POLLUTION CONTROL IN THE PRIMARY ALUMINUM INDUSTRY**  
 [PB-264483/9] 15 p0375 A77-25684
- STUDY OF CORROSION AND ITS CONTROL IN ALUMINUM SOLAR COLLECTORS**  
 [COO-2934-76-1] 15 p0383 A77-26673
- ENVIRONMENTAL CONSIDERATIONS OF SELECTED ENERGY CONSERVING MANUFACTURING PROCESS OPTIONS. VOLUME 8: ALUMINA/ALUMINUM INDUSTRY REPORT**  
 [PB-264274/2] 15 p0384 A77-26685
- ALUMINUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY AND THE METHOD OF PRODUCING SAID PANEL**  
 [NASA-CASE-HFS-23518-1] 16 p0535 A77-31610
- ALUMINUM ALLOYS**  
 Performance characteristics of solid lithium-aluminum alloy electrodes 13 p0007 A77-11107  
 Development and testing of solar water-heating boilers manufactured by diffusion welding 15 p0316 A77-37773  
 Development and testing of solar water-heater boilers fabricated by diffusion welding 16 p0437 A77-47429  
 Application of aluminum alloys for solar heating and cooling systems 16 p0487 A77-49068  
 Hydrogen absorption in Ti3Al 16 p0506 A77-51372
- ALUMINUM COATINGS**  
 The Alcoa 655 selective surface for aluminum --- for solar collectors 16 p0487 A77-49063
- ALUMINUM COMPOUNDS**  
 Development of an (AlGaAs-Ga As) graded band gap solar cell [NASA-CR-145161] 15 p0355 A77-23603
- ALUMINUM OXIDES**  
 In-place recovery of multiple products from Colorado's saline-mineral-bearing Piceance Basin 14 p0193 A77-27344  
 Corrosion problems related to the employment of aluminum in collector construction 14 p0202 A77-29566  
 Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films --- of solar collectors 16 p0502 A77-50281  
 Environmental considerations of selected energy conserving manufacturing process options. Volume 8: Alumina/aluminum industry report [PB-264274/2] 15 p0384 A77-26685  
 Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier [PB-266854/9] 16 p0525 A77-30255
- AMBIENT TEMPERATURE**  
 Ambient temperature electric vehicle batteries based on lithium and titanium disulfide 13 p0025 A77-12706  
 The analysis of the temperature regimes of the operation of a gas-regulated heat pipe 13 p0064 A77-17924  
 Rechargeability studies of ambient temperature lithium/sulfur batteries 16 p0447 A77-48729  
 The storability of Li/SO<sub>2</sub> cells 16 p0447 A77-48730
- AMMONIA**  
 Survey of absorption refrigeration systems 13 p0078 A77-19105  
 A new concept for the manufacture of low sulfur fuels and chemicals from coal 14 p0192 A77-27295

- Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 15 p0274 A77-33335
- Energy corradiation using the reversible ammonia reaction --- for solar power generation 16 p0422 A77-44483
- Heat pipe materials compatability [NASA-CR-135069] 13 p0103 N77-12182
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships [PB-255639/7] 13 p0109 N77-12552
- Investigations of nonsteady-state processes at cryogenic heat pipe operation --- filled with ammonia and Freon-22 13 p0119 N77-14384
- Production of ammonia using coal as a source of hydrogen [PB-259388/7] 14 p0233 N77-20613
- Design of an ocean thermal energy plant ship to produce ammchnia via hydrogen 14 p0237 N77-21564
- Environmental considerations of selected energy conserving manufacturing process options. Volume 7: Ammonia industry report [PB-264273/4] 15 p0384 N77-26684
- Internal heat transfer experiments in a simulated OTEC evaporator tube [APL/JHU/AEO-76-066] 16 p0521 N77-29611
- AMORPHOUS SEMICONDUCTORS**
- Electronic properties of amorphous silicon in solar cell operation 15 p0257 A77-30717
- Amorphous silicon solar cells 15 p0259 A77-30733
- Solar energy - The good features of amorphous silicon 16 p0438 A77-47850
- Solar energy utilization, solid state science, and a high efficiency amorphous-silicon absorber 16 p0487 A77-49065
- AMPLIFIERS**
- Shaping of laser pulses in an amplifying system receiving input signals with a variable spectrum 13 p0053 A77-15237
- AMPLITUDES**
- A new mathematical model for Stirling cycle machines 16 p0465 A77-48884
- AMPS (SATELLITE PAYLOAD)**
- AMPS - subsatellite assessment study, volume 1 [HBB-URV-91-76-VOL-1] 15 p0354 N77-23175
- ANAEROBES**
- Solar SNG - Large-scale production of SNG by anaerobic digestion of specially grown plant matter --- Synthetic Natural Gas 13 p0021 A77-12671
- Energy balance for anaerobic digestion 14 p0138 A77-20999
- Electrochemical neutralization of acid mine water 16 p0420 A77-43651
- Methane production from solid waste 16 p0434 A77-47218
- Anaerobic sludge digestion - A potential energy source 16 p0439 A77-47970
- ANDES MOUNTAINS (SOUTH AMERICA)**
- LANDSAT (ERTS) used as a basis for geological volcanological mapping in the central Andes [NASA-TM-75024] 15 p0390 N77-27474
- ANGULAR DISTRIBUTION**
- High-sensitivity detection procedures and devices for angular variations - Application to automatic control of a solar furnace heliostat 14 p0166 A77-23386
- Effect of angular misorientation on the performance of conical, spherical and parabolic solar concentrators 16 p0502 A77-50221
- ANHYDRIDES**
- Formation of sulfuric anhydride and nitrogen oxides in boilers at variable operating modes 15 p0272 A77-33174
- ANIK 1**
- Anik B, the new Canadian domestic satellite 15 p0499 A77-49249
- ANNUAL VARIATIONS**
- The influence of subsurface energy storage on seasonal temperature variations 13 p0067 A77-18351
- Study of an absorption solar refrigeration unit functioning on a round-the-clock basis 15 p0316 A77-37772
- Investigation of solar absorption cooler for round-the-clock operation 16 p0437 A77-47428
- An averaging technique for predicting the performance of a solar energy collector system 16 p0480 A77-49008
- The solar spectrum at typical clear weather days --- for optimal energy conversion cell performance 16 p0501 A77-50212
- ANNULAR FLOW**
- Annular-flow solar heater collector tubes [AIAA PAPER 77-190] 14 p0135 A77-19886
- ANODES**
- Photoelectrolysis with YFeO3 electrodes --- water splitting using solar energy 16 p0399 A77-40553
- Aluminum-based anodes for underwater fuel cells: A phase report [AD-A026405] 13 p0131 N77-15512
- ANTARCTIC REGIONS**
- Atmospheric carbon dioxide variations at the South Pole 13 p0067 A77-18439
- A framework for assessing environmental impacts of possible Antarctic mineral development, part 1 [PB-262750/3] 15 p0368 N77-24709
- ANTENNA ARRAYS**
- Microwave transmission system for space power 13 p0014 A77-11818
- Phase conjugation method and apparatus for an active retrodirective antenna array [NASA-CASE-NPO-13641-1] 15 p0360 N77-24340
- ANTENNA DESIGN**
- Antenna design for offshore satellite links 16 p0442 A77-48493
- ANTIFREEZES**
- Corrosion inhibitors for solar heating and cooling systems [NASA-TN-D-8409] 14 p0210 N77-17198
- ANTIREFLECTION COATINGS**
- Study and materialization of a selective surface designed for direct thermal conversion of solar energy - Application to medium temperature range 13 p0069 A77-18496
- Contribution to the study of solar energy collectors - Selective plates and cells 13 p0072 A77-19051
- Meeting electric power needs with photovoltaic power systems 13 p0076 A77-19091
- Selective behavior and selective layer deposition in the case of light-transparent covers --- for solar collectors 14 p0202 A77-29564
- A comparison of solar photothermal coatings 14 p0204 A77-29584
- Selective black absorbers using RF-sputtered Cr2O3/Cr cermet films 15 p0265 A77-31951
- Ellipsometry in the study of selective radiation-absorbing surfaces --- for solar energy 16 p0406 A77-41581
- A new Chrome Black selective absorbing surface --- for solar radiation 16 p0406 A77-41585
- HS silicon solar cells with In2O3 antireflective coating** 16 p0499 A77-49494
- Optimized selective coatings for solar collectors [NASA-TM-X-73498] 13 p0097 N77-11529
- Low reflectivity solar cells [AD-A025922] 13 p0108 N77-12539
- Silicon Schottky photovoltaic diodes for solar energy conversion [PB-263172/9] 15 p0357 N77-23624
- APPALACHIAN MOUNTAINS (NORTH AMERICA)**
- Acid mine drainage - The problem and the solution 16 p0425 A77-45125
- AQUEOUS SOLUTIONS**
- Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407
- Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831

- Thermal energy storage with saturated aqueous solutions 16 p0493 A77-49111
- An immiscible fluid - Heat of fusion energy storage system 16 p0493 A77-49113
- AQUIFERS**
- Numerical solutions for steady free convection in island geothermal reservoirs 14 p0174 A77-24205
- Recovery of heat energy from deep or shallow aquifers 14 p0175 A77-24206
- 'Low-energy' geothermal heat 14 p0178 A77-25001
- Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- ARAGONITE**
- Calcite-aragonite deposition in geothermal wells 16 p0418 A77-43025
- ARC DISCHARGES**
- Low arc drop hybrid mode thermionic converter 16 p0466 A77-48890
- ARCHITECTURE**
- The architecture of a passive system of diurnal radiation heating and cooling 16 p0423 A77-44488
- Compatible building design --- for solar heating retrofits 16 p0423 A77-44497
- The use of built form to enhance the output of wind collectors --- building design for wind concentration 16 p0490 A77-49090
- Solar high technology and architecture 16 p0495 A77-49129
- Perceptual assessment of a new energy concept 16 p0496 A77-49138
- The Crain solar house - A case study in the architectural and engineering design process as applied to solar housing for public sale 16 p0496 A77-49140
- Window design strategies to conserve energy [PB-269297/8] 16 p0559 A77-33669
- Building energy conservation programs: A preliminary examination of regulatory activities at the state level [PB-268873/7] 16 p0559 A77-33673
- ARGON**
- High temperature solar collector with an Archimedes concentrator 16 p0460 A77-48833
- Heat pipes with a non-condensable gas and their application in nuclear apparatus and instruments 13 p0120 A77-14387
- ARGON ISOTOPES**
- The nature and characteristics of the distribution of helium and argon isotopes in the geothermal waters of the Kuril Islands and Kamchatka 13 p0048 A77-13589
- The relation between isotopic composition of argon and carbon in natural gases [NASA-TM-75134] 16 p0531 A77-30680
- ARGON PLASMA**
- Non-equilibrium MHD power generation using non-seeded argon plasma 13 p0004 A77-11022
- Non equilibrium ionization in a linear magnetohydrodynamic generator, using a high pressure supersonic argon flow 15 p0309 A77-36817
- Argon contamination associated with ceramic regenerative heat exchangers for closed cycle MHD 15 p0326 A77-39536
- MHD power generation with fully ionized seed 16 p0443 A77-48571
- ARID LANDS**
- Solar photothermal power generation 14 p0146 A77-21700
- ARMATURES**
- Armature of the MIT-EPRI superconducting generator 14 p0157 A77-22575
- Reduction of the transverse edge effect in linear machines with homogeneous secondary armature by changing the air gap configuration 15 p0310 A77-36939
- ARMED FORCES**
- Some cost, energy, environmental, and resource implications of synthetic fuels produced from coal for military aircraft [AD-A026667] 13 p0118 A77-14271
- ARMED FORCES (UNITED STATES)**
- Analysis of the technical and cost feasibility of solar and/or wind energy systems for Coast Guard public quarters [AD-A028332] 14 p0209 A77-16460
- Navy applications for terrestrial photovoltaic solar power [AD-A030529] 14 p0218 A77-18590
- AROMATIC COMPOUNDS**
- Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal 16 p0442 A77-48489
- ARTIFICIAL SATELLITES**
- Use of radiation reflected from earth to increase the power of solar panels 15 p0363 A77-24586
- ASHES**
- Clean air protection and industrial development 13 p0010 A77-11303
- Deashing of coal liquefaction products via partial deasphalting. I - Hydrogen-donor extraction effluents. II - Hydrogenation and hydroextraction effluents 14 p0138 A77-20725
- Effects of devolatilization kinetics and ash behavior on coal fired MHD combustor design 14 p0141 A77-21248
- Development of the fluidized-bed carbon-burnup cell 16 p0454 A77-48789
- Flue gas desulfurization by fly ash 16 p0504 A77-51146
- Contamination of groundwater by heavy metals from the land disposal of fly ash [COO-2727-4] 15 p0357 A77-23631
- PCB emissions from stationary sources: A theoretical study [PB-262850/1] 15 p0367 A77-24665
- ASPECT RATIO**
- Natural convection phenomena in inclined cells with finite side-walls - A numerical solution --- solar energy absorption cells 16 p0500 A77-50201
- ASPHALT**
- Deashing of coal liquefaction products via partial deasphalting. I - Hydrogen-donor extraction effluents. II - Hydrogenation and hydroextraction effluents 14 p0138 A77-20725
- ASSAYING**
- Pyrolysis of oil shale: The effects of thermal history on oil yield [UCRL-77831] 13 p0129 A77-15499
- ASSEMBLIES**
- Development of standardized specifications for silicon solar cells [NASA-CR-135233] 16 p0520 A77-29604
- ASSESSMENTS**
- PCB emissions from stationary sources: A theoretical study [PB-262850/1] 15 p0367 A77-24665
- ASTEROIDS**
- Mass driver retrievals of earth-approaching asteroids --- earth orbit capture for mining purposes [IAAA PAPER 77-528] 15 p0265 A77-32053
- Deep space material sources --- from asteroids for space colonies 15 p0295 A77-35805
- Mining the Apollo and Amor asteroids 16 p0400 A77-40648
- ASTRONAUTICS**
- Extraterrestrial resources and astronautics --- Russian book 16 p0499 A77-49400
- ASTRONOMICAL OBSERVATORIES**
- The Lovell Observatory experimental solar heating module 16 p0476 A77-48976
- ASYNCHRONOUS MOTORS**
- Internal problem for the end effect in a linear asynchronous MHD-machine operating at an arbitrary current load 15 p0295 A77-35799

- Predicted and measured finite-width effects in linear induction machines  
16 p0413 A77-42628
- ATLANTA (GA)**  
Lessons learned from Atlanta /Towns/ solar experiment --- school building heating and cooling system  
16 p0476 A77-48971
- ATMOSPHERIC ATTENUATION**  
Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub>  
13 p0013 A77-11568  
The solar spectrum at typical clear weather days --- for optimal energy conversion cell performance  
16 p0501 A77-50212
- ATMOSPHERIC BOUNDARY LAYER**  
The spacing of wind turbines in large arrays  
16 p0416 A77-42893
- ATMOSPHERIC CHEMISTRY**  
The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model  
[PB-264822/8]  
16 p0517 N77-28628
- ATMOSPHERIC CIRCULATION**  
Aerothermic power plant with artificial cyclone  
13 p0077 A77-19098
- ATMOSPHERIC COMPOSITION**  
Atmospheric carbon dioxide variations at the South Pole  
13 p0067 A77-18439  
Distribution of some hydrocarbons in ambient air near Delft and the influence on the formation of secondary air pollutants  
15 p0271 A77-32954  
Tropospheric oxidation H<sub>2</sub>S  
16 p0411 A77-42254  
Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station  
16 p0504 A77-51135
- ATMOSPHERIC DIFFUSION**  
Comparison of calculated and measured maximum aboveground air pollutant concentrations and their respective distances from the source of release of large power plants  
[ORNL-TR-4231]  
15 p0386 N77-26712  
Modelling the atmospheric dispersal of radioactive pollutants beyond the first few hours of travel  
15 p0395 N77-27603
- ATMOSPHERIC EFFECTS**  
Meteorological data regarding the utilization of solar energy  
14 p0202 A77-29563  
Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer  
15 p0290 A77-34895  
Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere  
16 p0464 A77-48875  
Sensitivity of solar-cell performance to atmospheric variables. 1: Single cell  
[NASA-CP-2010]  
15 p0378 N77-26623  
Sensitivity of solar-cell performance to atmospheric variables. 2: Dissimilar cells at several locations  
[NASA-CP-2010]  
15 p0379 N77-26624
- ATMOSPHERIC HEAT BUDGET**  
Energetics of the midlatitude thermosphere  
13 p0012 A77-11492  
Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub>  
13 p0013 A77-11568
- ATMOSPHERIC HEATING**  
Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub>  
13 p0013 A77-11568  
The influence of subsurface energy storage on seasonal temperature variations  
13 p0067 A77-18351  
Atmospheric impacts of evaporative cooling systems  
[NRL-ES-53]  
15 p0367 N77-24643
- ATMOSPHERIC MODELS**  
The influence of subsurface energy storage on seasonal temperature variations  
13 p0067 A77-18351  
Wind power prediction models  
[NASA-CR-149235]  
13 p0105 N77-12509
- ATMOSPHERIC MOISTURE**  
Electric energy from atmospheric water vapor  
13 p0077 A77-19097  
Energy from humid air  
[AIAA PAPER 77-730]  
15 p0311 A77-37253  
Sensitivity of solar cell performance to atmospheric variables. 1: Single cell  
16 p0527 N77-30534
- ATMOSPHERIC OPTICS**  
Experimental and theoretical studies on solar energy for energy conversion  
16 p0471 A77-48932
- ATMOSPHERIC PHYSICS**  
Atmospheric ice nuclei - No detectable effects from a coal-fired powerplant plume  
13 p0054 A77-15780
- ATMOSPHERIC PRESSURE**  
The test reference year: A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun --- for heating and air conditioning systems design  
16 p0441 A77-48258
- ATMOSPHERIC RADIATION**  
Comparative discussion on measurements of atmospheric natural radioactivity and pollution by coal smoke particles  
15 p0294 A77-35349  
Insolation data for solar energy conversion derived from satellite measurements of earth radiance  
16 p0471 A77-48930
- ATMOSPHERIC REFRACTION**  
Servo positioning power tower collectors for solar heat conversion to electricity  
14 p0198 A77-28811  
Solar energy: L-division miscellaneous  
[UCID-17177]  
14 p0231 N77-20590
- ATMOSPHERIC SCATTERING**  
Results from circumsolar radiation measurements  
[LBL-5292]  
15 p0382 N77-26657
- ATMOSPHERIC TEMPERATURE**  
The influence of subsurface energy storage on seasonal temperature variations  
13 p0067 A77-18351  
Aerothermic power plant with artificial cyclone  
13 p0077 A77-19098  
Insolation and temperature statistics and their influence on the design of solar heating systems and the electric utility interface  
16 p0479 A77-49000
- ATMOSPHERIC WINDOWS**  
Infrared extinction spectra of some common liquid aerosols  
15 p0290 A77-34561
- ATOMIC BEAMS**  
Neutral injection at PPPL, past and present --- in toroidal plasma devices  
16 p0407 A77-41698
- ATOMIC PHYSICS**  
Report of the subcommittee on energy-related atomic and molecular science  
[PB-264052/2]  
15 p0375 N77-25673
- ATS**  
The ATS-6 power system - Hardware implementation and orbital performance  
13 p0040 A77-12831
- ATS 6**  
The ATS-6 power system: Hardware implementation and orbital performance  
[NASA-TP-1023]  
16 p0543 N77-32229
- ATTITUDE CONTROL**  
Servo positioning power tower collectors for solar heat conversion to electricity  
14 p0198 A77-28811  
An energy management guidance scheme applicable to the interim upper stage --- for orbital transfer maneuvers  
[AD-A034005]  
15 p0353 N77-23143
- ATTITUDE STABILITY**  
Nuclear-powered Hysat spacecraft: Comparative design study  
[ERDA-SRS-3063-8]  
13 p0094 N77-11108
- AUGER SPECTROSCOPY**  
Ternary compound thin film solar cells  
[PB-262536/6]  
15 p0374 N77-25662

# SUBJECT INDEX

# AUTOMOBILE ENGINES

- AUSTRALIA**
  - Solar energy in Australia 16 p0426 A77-45499
  - Progress report on the performance of three Australian solar hot water systems [SES-8] 15 p0364 N77-24604
- AUTOCALVING**
  - Batch autoclave studies of catalytic hydrodesulfurization of coal 14 p0145 A77-21617
- AUTOCORRELATION**
  - Autocorrelation and stochastic modelling of insolation sequences --- for solar thermal systems 16 p0422 A77-44479
- AUTOMATIC CONTROL**
  - Design of a tracking system for a solar-energy installation 13 p0015 A77-11919
  - High-sensitivity detection procedures and devices for angular variations - Application to automatic control of a solar furnace heliostat 14 p0166 A77-23386
  - Personal rapid transit research conducted at the Aerospace Corporation [PB-256846/7] 13 p0111 N77-12946
  - Automotive gas turbine fuel control [NASA-CASE-LEW-12785-1] 13 p0113 N77-13426
  - Method for producing solar energy panels by automation [NASA-CASE-LEW-12541-1] 15 p0344 N77-22615
- AUTOMATIC TEST EQUIPMENT**
  - Dynamic tests of hydrogen-powered IC engines 15 p0282 A77-33395
  - Solar cell array for concentrated sunlight 16 p0460 A77-48836
  - Underground coal mine instrumentation and test [NASA-CR-150045] 16 p0551 N77-33479
- AUTOMATION**
  - Demonstration of the feasibility of automated silicon solar cell fabrication [NASA-CR-135095] 13 p0129 N77-15492
- AUTOMOBILE ACCIDENTS**
  - Crash test of a liquid hydrogen automobile 14 p0244 N77-21635
- AUTOMOBILE ENGINES**
  - Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system 13 p0020 A77-12665
  - Application of a shunt motor and a 2 cylinder gasoline engine as a hybrid drive for an automobile 13 p0025 A77-12703
  - Electric vehicle performance with alternate batteries 13 p0025 A77-12707
  - Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708
  - Alternate fuel capability of Rankine cycle engines 13 p0036 A77-12801
  - Self-starting, intrinsically controlled Stirling engine 13 p0041 A77-12844
  - Noise mechanism separation and design considerations for low tip-speed, axial-flow fans 13 p0046 A77-13339
  - High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591
  - General Motors Sulfate Dispersion Experiment - Assessment of the EPA HIGHWAY model 13 p0071 A77-18882
  - Comparison of an electric versus a gasoline powered utility truck in two years of a service test program 14 p0160 A77-22891
  - Studies of electric vehicle drives, illustrated by the example of an urban estate car 14 p0160 A77-22893
  - Reduction of atmospheric pollution due to the automobile and energy savings 14 p0162 A77-22948
  - Whatever happened to the Wankel engine 15 p0272 A77-33125
  - An Otto for the automobile. II --- comparing engines utilizing different configurations and thermodynamic cycles 15 p0273 A77-33302
  - Automotive fuel-saving system with on-board hydrogen generation and injection into I. C. engines 15 p0280 A77-33384
  - Crash test of a liquid hydrogen automobile 15 p0282 A77-33397
  - Prototype hydrogen automobile using a metal hydride 15 p0282 A77-33398
  - Automotive hydride tank design 15 p0284 A77-33399
  - Use of hydrogen in automotive engines 15 p0283 A77-33401
  - Development of low-power gas turbines with regenerative heat exchangers at MTU. I 15 p0289 A77-34122
  - Volkswagen develops a diesel 15 p0290 A77-34630
  - The interaction of automotive-engine efficiency and exhaust pollution 15 p0296 A77-35922
  - A multigas analyzer for automobile exhausts 15 p0297 A77-36026
  - A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen 15 p0302 A77-36343
  - Electrochemical energy conversion. I - Electric vehicle propulsion 15 p0303 A77-36410
  - Running out of steam. III --- alternatives to internal combustion engine 15 p0310 A77-36984
  - Automotive engines - A viable alternative for aircraft [SAE PAPER 770466] 15 p0310 A77-37084
  - Optimization of automotive engine fuel economy and emissions 15 p0320 A77-38373
  - Emission and deposition of petrol engine exhaust Pb. I - Deposition of exhaust Pb to plant and soil surfaces 15 p0333 A77-39655
  - New developments on VW-PCI and VW-PCV stratified charge engine concepts --- Pre-Chamber-Injection and Pre-Chamber-Valve combustion processes 16 p0401 A77-41257
  - The development of small regenerative gas turbines at MTU. II 16 p0401 A77-41258
  - Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification [SAE PAPER 770047] 16 p0424 A77-44557
  - Design considerations on a thermal energy storage Stirling engine automobile [SAE PAPER 770080] 16 p0424 A77-44558
  - The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report [SAE PAPER 770081] 16 p0424 A77-44559
  - Design of the 4-215 D.A. automotive Stirling engine [SAE PAPER 770082] 16 p0424 A77-44560
  - Power plants and future fuels; Proceedings of the Conference, London, England, January 21, 22, 1975 16 p0428 A77-45956
  - Flywheel hybrid power trains. I - Component and drive selection. II - Numerical optimization and operation 16 p0438 A77-47968
  - Combustion technology for the improvement of engine efficiency and emission characteristics 16 p0440 A77-48172
  - Is an electric vehicle in your future 16 p0441 A77-48301
  - Further Stirling engine development work. I 16 p0442 A77-48496
  - The ERDA automotive gas turbine program 16 p0443 A77-48703
  - Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705
  - Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine 16 p0444 A77-48706
  - Thermal oscillators --- free piston valveless closed cycle Stirling or Ericsson cycle thermal machines 16 p0465 A77-48879

- Thermal energy storage and transportation  
16 p0497 A77-49153
- Development of a turbine rotor of silicon nitride  
16 p0503 A77-50651
- Chemical and physical characterization of  
automotive exhaust particulate matter in the  
atmosphere  
[PB-253375/0] 13 p0092 N77-10715
- Ceramic materials and components for small  
automotive gas turbine engine  
[AD-A025472] 13 p0095 N77-11417
- An evaluation of high altitude engine modification  
devices (econo-kit)  
[PB-255556/3] 13 p0101 N77-11589
- Investigation and assessment of light-duty-vehicle  
evaporative emission sources and control  
[PB-255813/8] 13 p0102 N77-11603
- Emissions and performance of catalysts for gas  
turbine catalytic combustors  
[NASA-TM-X-73543] 13 p0104 N77-12406
- Increased fuel economy in transportation systems  
by use of energy management: Second year's  
program. Executive summary  
[PB-256117/3] 13 p0108 N77-12536
- Research plan for achieving reduced automotive  
energy consumption  
[PB-255529/2] 13 p0121 N77-14495
- Effects of a thermal reactor on the energy  
efficiency of a turbocharged, stratified charge  
engine  
[AD-A026059] 13 p0128 N77-15409
- Flywheel-heat engine power for an energy-economic  
personal vehicle  
[BNWL-2006] 14 p0214 N77-18448
- Methanol engine: A transportation strategy for  
the post-petroleum era  
[UCRL-52041] 14 p0219 N77-19469
- Hydrogen-enrichment-concept preliminary evaluation  
[NASA-CR-152814] 15 p0340 N77-22290
- Ceramic applications in the advanced Stirling  
automotive engine  
[NASA-TM-X-73632] 15 p0354 N77-23487
- Ceramics for the advanced automotive gas turbine  
engine: A look at a single shaft design  
[NASA-TM-X-73651] 15 p0354 N77-23490
- The 1975 automotive characteristics data base  
[PB-262015/1] 15 p0354 N77-23507
- Effect of automotive parts on vehicle and engine  
emissions. Phase 1: Original equipment  
[PB-264057/1] 15 p0368 N77-24672
- Baseline gas turbine development program  
[COO-2749-15] 15 p0390 N77-27410
- Automobile emission control: Technological  
approaches toward improving in-use vehicle  
emissions performance  
[PB-267537/9] 16 p0544 N77-32508
- Compendium of critiques of JPL report SP-43-17:  
Automotive technology status and projections  
project  
[NASA-CR-155180] 16 p0552 N77-33519
- AUTOMOBILE FUELS**
- Onboard hydrogen generation for automobiles  
13 p0020 A77-12663
- The performance of hydrogen-injected reciprocating  
engines  
13 p0033 A77-12780
- Performance of a hydrogen-powered transit vehicle  
13 p0033 A77-12781
- Air, water, nuclear power make gasoline  
13 p0045 A77-12935
- An alternative fuel for cars --- hydrogen  
production and storage  
13 p0050 A77-14530
- Evolution of the concept of the automobile from  
the standpoint of saving energy  
13 p0051 A77-14562
- Alternate fuels for road vehicles of the future  
13 p0051 A77-14584
- Alcohol - A Brazilian answer to the energy crisis  
--- automobile fuel from manioc  
14 p0145 A77-21673
- Methanol - A clean burning fuel for automobile  
engines  
14 p0205 A77-29930
- Methanol gasoline blends - Future automotive fuels  
15 p0273 A77-33300
- Hydrogen storage on highway vehicles - Update '76  
15 p0280 A77-33380
- Hydrogen-powered highway vehicles - Applications  
and optimum form of fuel storage  
15 p0280 A77-33382
- Development of a liquid hydrogen car  
15 p0282 A77-33394
- Automotive sulfate emissions  
15 p0290 A77-34629
- Power plants and future fuels; Proceedings of the  
Conference, London, England, January 21, 22, 1975  
16 p0428 A77-45956
- In situ optical measurement of automobile exhaust  
gas particulate size distributions - Regular  
fuel and methanol mixtures  
16 p0440 A77-48173
- Exhaust and evaporative emission from a Brazilian  
Chevrolet fueled with ethanol-gasoline blends  
16 p0444 A77-48708
- Fuels and fuel additives for highway vehicles and  
their combustion products. Guide to evaluation  
of their potential effects on health  
[PB-254088/8] 13 p0084 N77-10222
- Impacts of synthetic liquid fuel development.  
Automotive market. Volume 1: Summary  
[PB-255994/6] 13 p0107 N77-12533
- Impacts of synthetic liquid fuel development.  
Automotive market. Volume 2  
[PB-255995/3] 13 p0108 N77-12534
- Survey of alcohol fuel technology, volume 1  
[PB-256007/6] 13 p0112 N77-13232
- Survey of alcohol fuel technology, volume 2  
[PB-256008/4] 13 p0112 N77-13233
- Energy equivalents for current and prospective  
automotive fuels in Canada  
[AD-A026195] 13 p0124 N77-14609
- Supply and demand of fuel sources for automobiles  
[UCRL-78066] 14 p0219 N77-19275
- Methanol engine: A transportation strategy for  
the post-petroleum era  
[UCRL-52041] 14 p0219 N77-19469
- Automotive fuel saving system with on-board  
hydrogen generation and injection into IC engines  
14 p0242 N77-21618
- Water induction in hydrogen-powered IC engines  
14 p0243 N77-21631
- Development of a liquid hydrogen car  
14 p0244 N77-21632
- Crash test of a liquid hydrogen automobile  
14 p0244 N77-21635
- Prototype hydrogen automobile using a metal hydride  
14 p0244 N77-21636
- Automotive hydride tank design  
14 p0244 N77-21637
- Use of hydrogen in automotive engines  
14 p0244 N77-21639
- Methanol as an automotive fuel: A summary of  
research in the M.I.T. Energy Laboratory  
[PB-262980/6] 15 p0356 N77-23619
- Petroleum market shares - A report on sales of  
refined petroleum products, 1972 through 1975:  
Aviation gasoline, jet fuels, middle distillate  
fuel oils, residual fuel oil, motor gasoline  
[PB-262726/3] 15 p0360 N77-24321
- Experimental results using methanol and  
methanol/gasoline blends as automotive engine fuel  
[BERC/RI-76/15] 15 p0389 N77-27245
- Methanol as automotive fuel. Part 1: Straight  
methanol  
[CONF-750264-1] 15 p0389 N77-27246
- AUTOMOBILES**
- The fuel efficiency potential of a flywheel hybrid  
vehicle for urban driving  
13 p0020 A77-12664
- Impacts of future use of electric cars in US cities  
14 p0161 A77-24902
- Development of electric vehicles at Toyota  
14 p0161 A77-22904
- Design and testing of lithium/iron sulfide  
batteries for electric-vehicle propulsion  
14 p0161 A77-22910
- A system consideration of the cryogenic storage  
tank for liquid hydrogen fueled vehicles and the  
resulting tank concept for a passenger car  
15 p0279 A77-33378
- The auto option --- bus usage in urban areas  
15 p0310 A77-36983
- Cryogenic fuel systems for motor vehicles  
16 p0411 A77-42166

- Comparing alternative methods of improving fuel economy --- in automobiles 16 p0443 A77-48702
- Improving automobile fuel economy with advanced transmissions 16 p0444 A77-48704
- Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle [AD-A026321] 13 p0124 N77-14607
- Battery-flywheel hybrid electric power system for near term application. Volume 2: System design [UCID-17098-VOL-2] 14 p0228 N77-20443
- Possible pollution and cost analysis from wide use of hydrogen fuel in transportation 14 p0247 N77-21664
- Fuel consumption, emissions, and power characteristics of the 1975 Ford 140-CID automotive engine, experimental data [PB-261771/0] 15 N77-22725
- The 1975 automotive characteristics data base [PB-262015/1] 15 p0354 N77-23507
- Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases [PB-263523/3] 15 p0354 N77-23518
- Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7] 15 p0361 N77-24504
- Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system [PB-262513/5] 15 p0361 N77-24505
- Vapor recovery analysis [PB-262846/9] 15 p0368 N77-24667
- Effect of automotive parts on vehicle and engine emissions. Phase 1: Original equipment [PB-264057/1] 15 p0368 N77-24672
- Electric vehicle research, development and technology - foreign [AD-A036458] 16 p0512 N77-28419
- Analysis of regenerated single-shaft ceramic gas-turbine engines and resulting fuel economy in a compact car [NASA-TN-X-3531] 16 p0521 N77-29607
- Automobile emission control. The development status, trends, and outlook as of December 1976 [PB-267865/4] 16 p0540 N77-31685
- AUXILIARY POWER SOURCES**
- Emergency power plant of rapid availability for the Berlin-Tegel airport 13 p0001 A77-10324
- Solar energy conversion - Work experience of a team applying methods and techniques of physics research to this sector 14 p0164 A77-23296
- Development of nickel-zinc batteries for aircraft 14 p0195 A77-28148
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0479 A77-49001
- Synchronous inversion - Concept and application --- use of intermittent variable power sources to supplement primary sources 16 p0490 A77-49088
- A new approach to planning with gas turbines [ASME PAPER 77-JPGC-GT-3] 16 p0509 A77-51623
- Auxiliary power system for activity cooled aircraft [NASA-CASE-LAR-11626-1] 13 p0103 N77-12332
- Possible effects of nuclear initiative on supply and use of electricity in California [AD-A026582] 13 p0131 N77-15510
- AUXILIARY PROPULSION**
- NASA electric propulsion program [AIAA PAPER 76-1068] 13 p0045 A77-13033
- AVANCEE DIODES**
- New modes of operation for avalanche diodes - Frequency multiplication and upconversion 13 p0049 A77-14261
- AVIONICS**
- Estimating procedures associated with aircraft modifications [SAWE PAPER 1101] 13 p0016 A77-12181
- Aircraft power supplies and cooling problems: A viewpoint from the power conditioner designer 14 p0207 N77-16039
- AXIAL FLOW**
- Axial conduction in a flat-plate solar collector 13 p0068 A77-18444
- Effects of one-sided heat input and removal on axially grooved heat pipe performance [AIAA PAPER 77-191] 14 p0135 A77-19887
- Excess liquid in heat-pipe vapor spaces [AIAA PAPER 77-748] 15 p0311 A77-37461
- AXIAL FLOW TURBINES**
- Performance of a total-flow impulse turbine for geothermal applications 16 p0456 A77-48808
- AXISYMMETRIC FLOW**
- Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe 15 p0306 A77-36708
- B**
- BACTERIA**
- Microbial hydrogen production 15 p0278 A77-33367
- Bioconversion of solar energy in salt water photosynthetic hydrogen production systems 15 p0278 A77-33369
- BALLOON FLIGHT**
- Results from the IMP-J violet solar cell experiment and violet cell balloon flights [NASA-TN-D-8393] 13 p0128 N77-15491
- BAND STRUCTURE OF SOLIDS**
- Operation of ITO/Si heterojunction solar cells 13 p0014 A77-11762
- Theory of the Schottky barrier solar cell 15 p0266 A77-32116
- Symposium on the Fundamental Optical Properties of Solids Relevant to Solar Energy Conversion [PB-256615/6] 13 p0108 N77-12538
- BARIUM SULFIDES**
- Thermochemical hydrogen production via a cycle using barium and sulfur - Reaction between barium sulfide and water 15 p0321 A77-38529
- BATTERY CHARGERS**
- The DDO bus, a suburban bus with electric drive, supplied either from overhead wire or from battery 14 p0161 A77-22913
- BEAM CURRENTS**
- Ignition of a pulsed thermonuclear reaction by high-current ion beams 14 p0164 A77-23106
- BEDS (GEOLOGY)**
- Large-scale thermal storage in rock - Construction, utilization, and economics 16 p0451 A77-48769
- BEDS (PROCESS ENGINEERING)**
- Low-Btu gasification of coal by Atomics International's molten salt process 13 p0023 A77-12687
- Hydrocarbon fuels from oil shale 13 p0023 A77-12692
- Desulfurization of flue gases with iron/III/ oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions --- German book 13 p0080 A77-19184
- Mathematical simulation of the fixed-bed pressurized gasification process 14 p0164 A77-23097
- Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts --- for fuel cells 14 p0176 A77-24568
- Gas-solid heat transfer coefficients in beds of crushed oil shale 14 p0196 A77-28472
- Packed bed digestion of solid wastes 15 p0323 A77-39107
- Numerical model of coal gasification in a packed bed 16 p0440 A77-48175
- Underground coal gasification - A status report 16 p0441 A77-48473
- BENZENE**
- Direct production of methane and benzene from coal 15 p0306 A77-36766

## BERYLLIUM HYDRIDES

Advanced fuels for inertial confinement --- in  
laser fusion

13 p0061 A77-17016

## BIBLIOGRAPHIES

Heat transfer - A review of 1975 literature

13 p0002 A77-10615

Cost aspects of solar energy - Selective and  
critical bibliography

13 p0054 A77-15799

Bibliography on solar cells

14 p0195 A77-28067

Survey of alcohol fuel technology, Volume 2

[PB-256008/4] 13 p0112 N77-13233

Inventory of energy research and development (1973  
- 1975), volume 1

[GPO-64-734-VOL-1] 13 p0113 N77-13525

Inventory of energy research and development (1973  
- 1975), volume 2

[GPO-64-734-VOL-2] 13 p0113 N77-13526

Inventory of energy research and development (1973  
- 1975), volume 3

[GPO-64-734-VOL-3] 13 p0113 N77-13527

Inventory of energy research and development (1973  
- 1975), volume 4

[GPO-64-734-VOL-4] 13 p0113 N77-13528

Bibliography on Liquefied Natural Gas (LNG) safety

[NASA-TM-X-73408] 13 p0127 N77-15208

Hydrogen Energy: A bibliography with abstracts.  
Fourth quarter 1976

[NASA-CR-149864] 14 p0220 N77-19577

Hydrogen Energy: A bibliography with abstracts.  
Third quarter 1976

[NASA-CR-149863] 14 p0220 N77-19578

Geothermal resources: Exploration and  
exploitation. A bibliography

[TID-3354-R1] 14 p0249 N77-21676

Long-range forecasting properties of  
state-of-the-art models of demand for electric  
energy. Volume 2: Annotated bibliography

[PB-261766/0] 14 p0251 N77-21718

Geothermal technoeosystems and water cycles in  
arid lands

[PB-263091/1] 15 p0354 N77-23592

Research leading to the production and early use  
of numeric data banks of material properties and  
system analyses

[UCRL-50038-76-2] 15 p0364 N77-24601

Perspectives in energy: 1976

[CES-17] 15 p0372 N77-25636

An annotated bibliography, volume 1, appendix 2

[NASA-TM-74765] 16 p0513 N77-28577

An annotated bibliography, volume 2, appendix 2

[NASA-TM-74764] 16 p0513 N77-28578

Solar cells and solar panels

[AD-A039100] 16 p0529 N77-30621

Health effects of pollutants associated with  
fossil-fuel power generation: An indexed  
bibliography with abstracts

[UCD-472-500] 16 p0540 N77-31672

In-situ coal gasification: Status of technology  
and environment impact

[PB-268576/6] 16 p0548 N77-32613

Reclamation of energy from solid waste: Theory  
and practice. A selected, annotated  
bibliography for Pennsylvania local government  
officials

[PB-267800/1] 16 p0555 N77-33621

## BINARY ALLOYS

Thermal storage in metals

16 p0492 A77-49105

## BINARY FLUIDS

Investigation of heat exchanger flow arrangement  
on performance and cost in a geothermal binary  
cycle

13 p0029 A77-12746

Investigation of heat exchanger flow arrangement  
on performance and cost in a geothermal binary  
cycle

[UCRL-78390] 14 p0221 N77-19587

Modeling and optimization of geothermal power  
plants using the binary fluid cycle

[BNWL-2112] 16 p0521 N77-29609

## BIOASSAY

JP-4 and JP-9 fuel toxicity studies using water  
fish and aufwuchs

[AD-A027594] 13 p0127 N77-15213

## BIOCHEMICAL FUEL CELLS

Fuels via bioconversion

14 p0176 A77-24569

## BIOCHEMISTRY

Feasibility studies of a biochemical  
desulfurization method --- using microorganisms  
as agent from high sulfur containing petroleum

14 p0170 A77-23562

Microbial hydrogen production

15 p0278 A77-33367

## BIODEGRADATION

SWG from refuse and sewage sludge by the BIOGAS  
process

15 p0314 A77-37659

Synthetic natural gas from animal wastes by  
anaerobic fermentation

15 p0314 A77-37660

Fuel gas from landfill

15 p0314 A77-37661

Quantitative studies on marine biodegradation of  
oil. III - Comparison of different crude oil  
residues and effects of sea water source

16 p0425 A77-44675

The origin of the oil sand bitumens of Alberta - A  
chemical and a microbiological simulation study

16 p0438 A77-47765

Heat treatment of refuse for increasing anaerobic  
biodegradability

[PB-252924/6] 13 p0101 N77-11577

Thermal effects on biodegradation of pollutants in  
water

[PB-261512/8] 15 p0350 N77-22709

The biodegradation of oil in sea water for naval  
pollution control

[AD-A042375] 16 p0560 N77-33688

## BIOLOGICAL EFFECTS

Effects of anthropogenic emissions on climate - A  
review of selected topics

13 p0067 A77-18295

Effects of thermal pollution on certain aquatic  
invertebrates

[PB-263488/9] 15 p0368 N77-24673

Ecological review of hydroelectric reservoirs in  
Puerto Rico

[CEER-1] 16 p0540 N77-31673

## BIOLOGICAL EVOLUTION

The paleoprotophobic origin of energy metabolism  
--- chemiosmotic precursor to phototropism in  
estuarine cellular organisms

13 p0064 A77-17895

## BIOMASS ENERGY PRODUCTION

The long-range prospects for solar-derived fuels

13 p0017 A77-12240

Solar SWG - Large-scale production of SWG by  
anaerobic digestion of specially grown plant  
matter --- Synthetic Natural Gas

13 p0021 A77-12671

Solar energy collection by bioconversion

13 p0021 A77-12672

Nuclear power for the production of synthetic  
fuels and feedstocks

13 p0035 A77-12790

Solar energy utilization - The photochemical  
approach

13 p0075 A77-19076

Formulation of energy policies - The case of West  
Africa

13 p0080 A77-19124

Alcohol - A Brazilian answer to the energy crisis  
--- automobile fuel from manioc

14 p0145 A77-21673

Clean fuels from biomass

14 p0167 A77-23390

Fuels via bioconversion

14 p0176 A77-24569

Energy from bio-conversion for developing countries

15 p0270 A77-32592

Energy from the oceans - Requirements and  
capabilities

15 p0272 A77-33141

Solar energy prospects grow for US southwest

15 p0297 A77-36049

China claims lead in biogas energy supply

15 p0297 A77-36050

Clean fuels from biomass, sewage, urban refuse,  
agricultural wastes; Proceedings of the  
Symposium, Orlando, Fla., January 27-30, 1976

15 p0313 A77-37652



## SUBJECT INDEX

## BOILERS

Wastes and biomass as energy resources - An overview  
15 p0313 A77-37654

The conversion of ocean farm kelp to methane and  
other products  
15 p0314 A77-37662

An economic assessment of fuelgas from water  
hyacinths  
15 p0314 A77-37663

Energy from agriculture  
15 p0314 A77-37664

Gas production from micro algae  
15 p0314 A77-37665

Enzymatic hydrolysis of cellulosic wastes to  
fermentable sugars for alcohol production  
15 p0315 A77-37666

Design, operation and economics of the energy  
plantation  
15 p0315 A77-37667

Federal Fuels from Biomass Energy  
Program  
15 p0315 A77-37670

Fuels from biomass - Energy outlay versus energy  
returns: A critical appraisal  
15 p0322 A77-38673

Energy from bioconversion of waste materials ---  
Book  
16 p0407 A77-41649

Photosynthetic solar energy - Rediscovering  
biomass fuels  
16 p0421 A77-44396

Biomass energy for Hawaii. Volume 1 - Summary and  
background. Volume 2 - Sugar operations. Volume  
3 - Mixed municipal refuse. Volume 4 -  
Terrestrial and marine plantations --- Book  
16 p0428 A77-46250

Methane production from solid waste  
16 p0434 A77-47218

Cassava fuel alcohol in Brazil  
16 p0444 A77-48707

Solid fuels from biomass - Some environmental and  
economic considerations  
16 p0445 A77-48712

The prospects for fuels from biomass  
16 p0445 A77-48713

The photosynthesis energy factory - Analysis,  
synthesis, and demonstration  
16 p0449 A77-48753

Recent Canadian activities in biomass  
16 p0470 A77-48917

Fuels and chemicals from the sun through  
bioconversion  
16 p0488 A77-49076

Silviculture energy plantations  
16 p0488 A77-49079

Field crops as a future source of fuels and  
chemical feedstocks  
16 p0489 A77-49080

Methane production through bioconversion of  
agriculture residues  
16 p0489 A77-49081

A feasibility study of bio-gas production in  
individual farms in Southwestern Ontario  
16 p0489 A77-49082

Agricultural and forestry wastes as an energy  
resource  
16 p0489 A77-49083

Perpetually renewable biomass prospects - A  
comparison of U.S. and Canadian ecosystem  
carrying capacities vs needs  
16 p0489 A77-49084

Rural energy centre for Africa using solar, wind  
and biogas energies  
16 p0496 A77-49139

Design, operation and economics of the Energy  
Plantation  
16 p0497 A77-49154

Fuel and energy production by bioconversion of  
waste materials: State-of-the-art  
[PB-258499/3]  
14 p0219 A77-19279

Biosolar production of fuels from algae  
[UCRL-52177]  
16 p0511 A77-28323

Unconventional energy sources  
[PB-268301/9]  
16 p0548 A77-32617

Marine pastures: A by-product of large (100  
megawatt or larger) floating ocean-thermal power  
plants  
[COO-2581-3]  
16 p0555 A77-33625

**BIO MEDICAL DATA**  
Balanced program plan. Volume 4: Coal conversion  
[ORNL-5123-VOL-4]  
14 p0216 A77-18566

Coal conversion: Description of technologies and  
necessary biomedical and environmental research  
[ORNL-5192]  
15 p0392 A77-27520

**BIOSPHERE**  
Effects of anthropogenic emissions on climate - A  
review of selected topics  
13 p0067 A77-18295

**BIOTECHNOLOGY**  
Industrial development in zero-G  
15 p0295 A77-35812

**BISMUTH**  
Heat-pipe bismuth laser; examination of laser  
action at 4722 Å in bismuth vapor  
[AD-A039568]  
16 p0533 A77-31495

**BITUMENS**  
Catalytic coal liquefaction using synthesis gas  
13 p0059 A77-16473

Path of development and developmental status of  
the lignite high-temperature coking process in  
the DDR - An example of effective utilization of  
lignite as energy vehicle  
14 p0163 A77-23096

Sulfur compounds in oils from the Western Canada  
Tar Belt  
14 p0169 A77-23553

Characterization of a Utah tar sand bitumen  
14 p0170 A77-23561

Combustion of pulverized, solvent-refined coal  
[ASME PAPER 76-WA/FU-6]  
14 p0185 A77-26456

The Riley-Morgan gasifier  
14 p0193 A77-27298

The Asphalt Ridge tar-sand deposits  
14 p0193 A77-27347

Recovery of bitumen from oil-impregnated sandstone  
deposits of Utah  
14 p0194 A77-27349

Multi-stage activation of brown-coal chars with  
oxygen  
16 p0401 A77-41319

The origin of the oil sand bitumens of Alberta - A  
chemical and a microbiological simulation study  
16 p0438 A77-47765

**BLACK BODY RADIATION**  
Thermodynamic constraints, effective temperatures  
and solar cells  
14 p0147 A77-21779

A geometrical spectral selective window --- for  
conversion of solar energy into heat  
14 p0148 A77-21793

**BLACK BRANT SOUNDING ROCKETS**  
The International Heat Pipe Experiment --- Black  
Brant sounding rocket payload zero gravity  
experiment  
13 p0120 A77-14389

**BLUE GREEN ALGAE**  
The photosynthetic production of hydrogen  
15 p0278 A77-33368

Biosolar production of fuels from algae  
[UCRL-52177]  
16 p0511 A77-28323

**BOILERS**  
Influence of heavy fuel oil composition and boiler  
combustion conditions on particulate emissions  
13 p0008 A77-11162

Steam station repowering - A near-term method of  
energy conservation  
13 p0022 A77-12679

Alternate fuel capability of Rankine cycle engines  
13 p0036 A77-12801

Heat tests with a GT-35 gas turbine as an element  
of steam-gas facility with a high-pressure steam  
generator  
14 p0136 A77-20109

Utilization of disposed petroleum products and  
industrial wastes as fuels  
14 p0167 A77-23404

Coal-in-oil - A substitute boiler fuel  
[ASME PAPER 76-WA/FU-2]  
14 p0185 A77-26453

Combined utilization of nuclear and organic fuels  
15 p0272 A77-33159

Formation of sulfuric anhydride and nitrogen  
oxides in boilers at variable operating modes  
15 p0272 A77-33174

Hydrogen production process by means of nuclear  
energy  
15 p0273 A77-33327

The aqueous homogeneous reactor as a source of  
hydrogen and of process heat  
15 p0274 A77-33329

Hydrogen production from nuclear waste energy  
15 p0274 A77-33331

Solar tower characteristics  
15 p0274 A77-33333

State of the art of particulate and SO<sub>2</sub> removal on  
coal fired boilers  
15 p0293 A77-35167

1-MW solar boiler tested  
15 p0303 A77-36349

Solar energy systems of the tower type -  
Arrangement and heat-stability of the receivers  
and steam generators  
15 p0316 A77-37770

Development and testing of solar water-heating  
boilers manufactured by diffusion welding  
15 p0316 A77-37773

Solar heating in residential houses in Uzbekistan  
15 p0316 A77-37774

Producer gas from agricultural wastes - Its  
production and utilization in a converted  
oil-fired boiler  
15 p0323 A77-39106

Status of the reference dual-cycle MHD-steam power  
plant  
15 p0332 A77-39577

Energy recovery by the incineration of solid waste -  
Development, present status and experiences in  
Germany  
15 p0334 A77-39675

Dynamic characteristics of the desulfurization  
plant boiler draft system for power stations  
15 p0338 A77-40201

A tower-type solar power plant - Configuration and  
thermal-regime stability of receivers and steam  
generators  
16 p0437 A77-47426

Development and testing of solar water-heater  
boilers fabricated by diffusion welding  
16 p0437 A77-47429

Residential solar heating in Uzbekistan  
16 p0437 A77-47430

A unitized 500-megawatt fluidized bed boiler design  
16 p0453 A77-48786

Dynamic modeling of fluidized bed boilers for  
control system design  
16 p0454 A77-48792

Solar powered steam generation  
16 p0459 A77-48832

1 MWth solar cavity steam generator solar test  
program  
16 p0461 A77-48846

Central receiver solar thermal power  
16 p0484 A77-49037

Demand sensitive energy storage in molten salts  
16 p0491 A77-49102

Air pollution control for industrial coal-fired  
boilers  
16 p0504 A77-51152

Study of the feasibility of federal procurement of  
fuels produced from solid wastes  
[PB-255695/9]  
13 p0096 N77-11513

Assessment of the impact of proposed thermal  
effluent guidelines for the steam electric power  
industry  
[PB-255937/5]  
13 p0110 N77-12587

Design phase utility analysis for gas turbine and  
combined cycle plants  
[PB-256665/1]  
13 p0115 N77-13553

Performance of emission control devices on boilers  
firing municipal solid waste and oil  
[PB-257136/2]  
13 p0133 N77-15550

Technical and economic feasibility of solar  
augmented process steam generation  
[COO-2732-1]  
14 p0250 N77-21692

Assessment of the potential for energy  
conservation through improved industrial boiler  
efficiency, volume 1  
[PB-262576/2]  
15 p0374 N77-25665

Energy Conversion Alternatives Study (ECAS), Phase  
2. Volume 3: Summary and advanced steam plant  
with pressurized fluidized bed boilers  
[NASA-CN-134942-VOL-3]  
15 p0379 N77-26630

Technical and economic feasibility of solar  
augmentation for boiler feedwater heating in  
steam-electric power plants  
[COO-2864-1]  
16 p0555 N77-33626

## BOLIVIA

The 29950 Earth Resource Technology Satellite  
(ERTS-A) sensor data for mineral resource sector  
development and regional land use survey, March  
- August 1976 --- Bolivia  
[E77-10028]  
13 p0096 N77-11491

LANDSAT (ERTS) used as a basis for geological  
volcanological mapping in the central Andes  
[NASA-TN-75024]  
15 p0390 N77-27474

BORING MACHINES  
New turbodrill for geothermal drilling  
16 p0456 A77-48810

Thermocorer for geothermal applications  
16 p0456 A77-48811

BORON  
Conditions for a boron fusion reactor in the MeV  
range  
16 p0436 A77-47366

BOUNDARY LAYER CONTROL  
Energy and economic trade offs for advanced  
technology subsonic aircraft  
14 p0201 A77-29471

BOUNDARY LAYER FLOW  
Effect of nonuniform conductivity in the boundary  
layer at the electrode wall on local  
characteristics of an MHD generator with a  
diagonal electrode configuration and a subsonic  
stream  
13 p0001 A77-10423

Calculation of turbulent magnetohydrodynamic  
boundary layers in MHD generator channels  
13 p0046 A77-13242

The influence of lateral mass efflux on free  
convection boundary layers in a saturated porous  
medium  
[PB-261558/1]  
15 p0342 N77-22587

BOUNDARY LAYER SEPARATION  
Boundary-layer separation from the electrode wall  
of an MHD generator  
13 p0048 A77-13711

Diffuser augmentation of wind turbines  
[CONF-760842-6]  
16 p0521 N77-29610

BOUNDARY LAYER STABILITY  
Salt requirement and stability of solar ponds  
16 p0482 A77-49027

BOUNDARY LAYERS  
Study of the electrical characteristics of the  
boundary layer on the metal surfaces in the  
channels of an open cycle MHD generator  
13 p0054 A77-15666

BRAKES (FOR ARRESTING MOTION)  
Flywheel module for electric vehicle regenerative  
braking  
16 p0447 A77-48728

BRAKING  
Energy storage propulsion system for advanced  
concept train --- braking energy recovery  
14 p0200 A77-29467

The use of composite flywheels for braking energy  
recovery in road transport vehicles  
16 p0401 A77-41351

BRAYTON CYCLE  
A conceptual design study of closed Brayton cycle  
gas turbines for fusion power generation  
13 p0022 A77-12676

Multipurpose insulation system for a radioisotope  
fueled Mini-Brayton Heat Source Assembly  
13 p0022 A77-12678

10 MW solar thermal electric power plant design  
for solar day operation  
14 p0153 A77-21842

A modular fixed-mirror Brayton-cycle solar power  
system  
14 p0154 A77-21846

Gas-fired heat pumps - An emerging technology  
14 p0195 A77-27891

Closed Brayton cycle turbines for satellite solar  
power stations  
15 p0296 A77-35816

Conceptual design of closed Brayton cycle for  
coal-fired power generation  
16 p0445 A77-48714

Light commercial Brayton/Rankine space  
conditioning system  
16 p0445 A77-48716

Thermal scale modeling of the central receiver of  
a helium Brayton cycle solar powerplant  
16 p0445 A77-48717

# SUBJECT INDEX

# BUILDINGS

- Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant  
16 p0461 A77-48842
- Closed Brayton cycle using hydrogen as a work fluid [BNL-20899]  
13 p0085 A77-10542
- Braxton isotope power system. Phase 1: (Ground demonstration system) Configuration Control Document (CCD) [TID-27252]  
15 p0380 A77-26644
- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application  
16 p0532 A77-31207
- BRAZIL**  
Solar energy prospects for electric power generation in Brazil  
13 p0037 A77-12805
- BREADBOARD MODELS**  
Experimental evaluation of a breadboard heat and product-water removal system for a space-power fuel cell designed with static water removal and evaporative cooling [NASA-TN-D-8485]  
15 p0363 A77-24592
- BREEDER REACTORS**  
Environment and energy production after the year 2000  
13 p0056 A77-16203
- Comparative breeding characteristics of fusion and fast reactors  
15 p0297 A77-36124
- Research needs report: Energy conversion research --- Book  
15 p0313 A77-37646
- Improvements in energy conversion technology  
16 p0505 A77-51154
- Energy requirement for the production of silicon solar arrays [NASA-CR-153409]  
16 p0528 A77-30604
- Gas cooled reactor assessment, volume 1 [TID-27424-VOL-1]  
16 p0541 A77-31945
- BRINES**  
Effect of reservoir temperature decline on geothermal power plant design and economics  
16 p0456 A77-48805
- Using Salton Sea Geothermal brines for electrical power: A review of progress in chemistry and materials technology - 1976 Status  
16 p0469 A77-48908
- Corrosivity of geothermal brines [ORNL-TM-5688]  
15 p0359 A77-24265
- BROMIDES**  
Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation  
16 p0498 A77-49165
- Measured performance of a 3 ton LiBr absorption water chiller and its effect on cooling system operation [NASA-TM-X-73496]  
13 p0105 A77-12518
- BUBBLES**  
VBP heat pipes for energy storage --- Vapor Bubble Pumping  
13 p0032 A77-12767
- BUDGETING**  
Energy R&D modeling for budgetary decisions  
15 p0319 A77-38218
- Energy conservation in the investment policies of French firms. I - Formulation of the problem  
15 p0324 A77-39504
- Energy research: Alternative strategies for development of new energy technologies and their implications for the Federal budget [PAPER-10]  
15 p0372 A77-25632
- BUILDINGS**  
Optimal thermal insulation as an investment-computational problem  
13 p0009 A77-11268
- Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864
- Combined solar and petroleum energy HVAC system for a commercial building in Dahrhan --- Heating, Ventilating and Air Conditioning  
13 p0078 A77-19112
- Preliminary design data for a solar house in Riyadh, Saudi Arabia  
13 p0078 A77-19112
- Application of solar heat to buildings in Austria  
13 p0079 A77-19114
- Environmentally designed housing incorporating solar energy  
13 p0079 A77-19115
- Solar heating and cooling  
14 p0156 A77-22025
- The ASHRAE monograph on applications of solar energy for heating and cooling buildings  
14 p0167 A77-23441
- Design application using solar energy to control the environment in a major office building  
14 p0168 A77-23442
- Solar energy retrofit for existing buildings  
14 p0168 A77-23444
- Solar retrofit in a large institutional building - An economic analysis  
14 p0176 A77-24500
- Simulation and cost optimization of solar heating of buildings in adverse solar regions  
14 p0180 A77-25897
- Design of a solar heating and cooling system for CSU Solar House II  
14 p0181 A77-25902
- Determination of average ground reflectivity for solar collectors  
14 p0181 A77-25903
- Solar heating and cooling of a 25,500 square foot building  
14 p0181 A77-26054
- Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps [ASME PAPER 76-WA/SOL-23]  
14 p0190 A77-26528
- On enthalpy management in small buildings --- energy storage and conservation in residential structures  
14 p0194 A77-27354
- Dimensioning of the solar heating system in the Zero Energy House in Denmark  
15 p0256 A77-30319
- Energy savings by application of knowledge of building physics. I - Wall permeability and its significance for the atmospheric conditions in the building interior, the design and the thermal characteristics of windows, problems concerning the permeability of the joints  
15 p0261 A77-31373
- Solar energy in the building --- French book  
15 p0303 A77-36411
- Energy management for commercial buildings and cooling storage [AIAA 77-1004]  
16 p0402 A77-41552
- Energy savings obtained by applying the findings of construction physics. II  
16 p0441 A77-48259
- Geothermal space heating - The symbiosis with fossil fuel  
16 p0455 A77-48797
- The Page-Jackson Elementary School solar heating and cooling system  
16 p0462 A77-48851
- The Shenandoah Solar Community Center  
16 p0476 A77-48974
- Solar heating for buildings in Ontario - Experience and analysis of single, multiple residential and commercial low rise buildings  
16 p0476 A77-48975
- Design and construction of solar space heating and hot water supply systems for experimental multi-family housing  
16 p0477 A77-48979
- Solar heating in northern New England  
16 p0477 A77-48980
- A hybrid solar-assisted heat pump system for residential applications  
16 p0477 A77-48981
- The use of built form to enhance the output of wind collectors --- building design for wind concentration  
16 p0490 A77-49090
- Commercialization of solar heating and cooling of buildings  
16 p0496 A77-49142
- The design of a solar cooling and heating system for a commercial building  
16 p0497 A77-49148
- Solar hot water systems application to the solar building test facility and the Tech House  
13 p0084 A77-10342

Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling  
[NASA-CR-150032] 13 p0086 N77-10638

Waste heat vs conventional systems for greenhouse environmental control: An economic assessment  
[ORNL-TM-5069] 13 p0088 N77-10656

CCMS solar energy pilot study solar heating and cooling systems in buildings  
[UND-4908-5] 13 p0088 N77-10657

Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire  
[PB-254179/5] 13 p0091 N77-10687

Commercial building unitary heat pump system with solar heating  
[PB-255488/9] 13 p0099 N77-11551

Definition study for photovoltaic residential prototype system  
[NASA-CR-135039] 13 p0113 N77-13532

Definition study for photovoltaic residential prototype system  
[NASA-CR-135056] 13 p0113 N77-13533

Interim feasibility assessment method for solar heating and cooling of Army buildings  
[AD-A026588] 13 p0124 N77-14606

The structure of building specifications  
[PB-257581/9] 13 p0132 N77-15524

Intermediate minimum property standards for solar heating and domestic hot water systems  
[PB-257086/9] 13 p0132 N77-15525

The design of a solar energy collection system to augment heating and cooling for a commercial office building  
[NASA-TM-X-72753] 14 p0207 N77-16446

Experimental polyurethane foam roofing systems  
[AD-A031046] 14 p0210 N77-17255

Solar heating retrofit of military family housing  
[AD-A030843] 14 p0226 N77-19659

Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire  
[AD-A031803] 14 p0228 N77-20393

NASA Technology Utilization House technical support package  
[NASA-TM-X-74686] 15 p0358 N77-24011

Baseline performance of solar collectors for NASA Langley solar building test facility  
[NASA-TM-X-3505] 15 p0363 N77-24587

Design of municipal services in support of high rise office buildings  
[PB-262532/5] 15 p0370 N77-25021

General Electric Company survey to define impact of statewide building codes on solar HVAC systems, commercial buildings. National Solar Demonstration Program  
[COO-2683-76-11] 15 p0383 N77-26674

National program for solar heating and cooling of buildings  
[ERDA-76-6] 16 p0515 N77-28604

Energy utilization index method for predicting building energy use. Volume 2: Proposed supplement to TB ENG 529  
[AD-A040344] 16 p0521 N77-29608

Demonstration of building heating with a heat pump using thermal effluent  
[AD-A041024] 16 p0530 N77-30631

Comparison of computer-predicted and observed energy uses in a multi-family high-rise apartment building  
[PB-267829/0] 16 p0539 N77-31665

Market evaluation study: Solar heating and domestic hot water heating in DoD buildings  
[AD-A042178] 16 p0546 N77-32597

**BURNERS**

Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation  
16 p0439 A77-48092

Burner design criteria for control of NOx from natural gas combustion. Volume 2: Raw data and experimental results  
[PB-256806/1] 13 p0115 N77-13549

**BURNING RATE**

Combustion of oil-shale carbon residue  
14 p0193 A77-27343

**BURNING TIME**

Combustion of oil-shale carbon residue  
14 p0193 A77-27343

**BURNOUT**

Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply  
15 p0272 A77-33170

**BUTANES**

Sensitivity analysis for OTFC propane and mixture cycles --- Ocean Thermal Energy Conversion  
16 p0485 A77-49047

Petroleum market shares. Report on sales of propane to ultimate consumers, 1975  
[PB-255624/9] 13 p0108 N77-12540

Conceptual design of a 10MW regenerative isobutane geothermal power plant  
[PB-261563/1] 15 p0349 N77-22683

**C****CADASTRAL MAPPING**

Experience in constructing a solar energy cadastral survey  
16 p0443 A77-48525

**CADMIUM ANTIMONIDES**

Theoretical and experimental validation of new sources of electrical energy  
14 p0176 A77-24457

**CADMIUM COMPOUNDS**

Evaluation of cadmium stannate films for solar heat collectors  
14 p0198 A77-29021

Laboratory investigations on thermochemical hydrogen production  
15 p0276 A77-33348

Cadmium stannate selective optical films for solar energy applications  
[PB-261850/2] 15 p0348 N77-22672

**CADMIUM SELENIDES**

Evaluation of CdS photovoltaic cells in the framework of the development of solar electric power plants  
14 p0149 A77-21796

Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions  
14 p0149 A77-21801

Photoelectrochemical energy conversion and storage - The polycrystalline CdSe cell with different storage modes  
14 p0196 A77-28463

Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe  
15 p0259 A77-30742

Spectral response and efficiency relations in semiconductor liquid junction solar cells  
15 p0264 A77-31823

Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells  
15 p0320 A77-38367

**CADMIUM SULFIDES**

CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica substrates  
13 p0007 A77-11110

Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells  
13 p0069 A77-18517

Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells  
14 p0147 A77-21781

Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell  
14 p0149 A77-21797

Technology of large area Cu<sub>x</sub>/S-CdS solar cells  
14 p0149 A77-21798

Investigation on the crystalline structure of Cu<sub>x</sub>/S-CdS solar cells  
14 p0149 A77-21803

High efficiency n-CdS/p-InP solar cells prepared by the close-spaced technique  
14 p0156 A77-22081

Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis  
14 p0198 A77-29023

Preparation of CdS/InP solar cells by chemical vapor deposition of CdS  
14 p0205 A77-29893

Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell  
15 p0258 A77-30721

InP-CdS solar cells  
15 p0259 A77-30740

## SUBJECT INDEX

## CAPILLARY FLOW

- Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions  
15 p0259 A77-30741
- Spectral response and efficiency relations in semiconductor liquid junction solar cells  
15 p0264 A77-31823
- Analysis of the fill factor for n-CdS/p-CdTe solar cells  
16 p0402 A77-41433
- Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions  
16 p0442 A77-48518
- Solar cells for terrestrial applications  
16 p0485 A77-49050
- CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications  
16 p0486 A77-49059
- CuInSe<sub>2</sub>/CdS thin film solar cells  
16 p0486 A77-49062
- N-CdS/n-GaAs voltage-enhanced photoanode --- in photoelectrochemical solar cell  
16 p0503 A77-50287
- Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell [PB-252409/8]  
13 p0089 A77-10672
- Cadmium stannate selective optical films for solar energy applications [PB-254879/0]  
13 p0090 A77-10678
- Applied research on II-VI compound [PB-254637/2]  
13 p0098 A77-11547
- Assessment of cadmium sulfide photovoltaic arrays for large scale electric utility applications [PB-255646/2]  
13 p0109 A77-12551
- Ternary compound thin film solar cells [PB-262536/6]  
15 p0374 A77-25662
- Ternary compound thin film solar cells - 1 [PB-265003/4]  
15 p0395 A77-27561
- Thin film solar cells for terrestrial applications [PB-265987/7]  
16 p0523 A77-29635
- CADMIUM TELLURIDES**  
Ceramic thin film CdTe solar cell  
14 p0135 A77-19635
- Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis  
14 p0198 A77-29023
- Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions  
15 p0259 A77-30741
- Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe  
15 p0259 A77-30742
- Cathodes for photodriven hydrogen generators - ZnTe and CdTe  
15 p0296 A77-35921
- Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters  
15 p0320 A77-38330
- Analysis of the fill factor for n-CdS/p-CdTe solar cells  
16 p0402 A77-41433
- Applied research on II-VI compound [PB-254637/2]  
13 p0098 A77-11547
- CALCITE**  
Calcite-aragonite deposition in geothermal wells  
16 p0418 A77-43025
- CALCIUM**  
Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier [PB-266854/9]  
16 p0525 A77-30255
- CALIBRATING**  
Consideration of design and calibration of terrestrial reference solar cells  
16 p0527 A77-30531
- CALIFORNIA**  
Construction and interpretation of a digital inertia image --- of Pisgah Crater and Lavin Lake in Southern California  
16 p0421 A77-44464
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California [PB-254449/2]  
13 p0092 A77-10720
- Wind power prediction models [NASA-CR-149235]  
13 p0105 A77-12509
- California energy outlook [UCRL-5196-REV-1]  
13 p0106 A77-12525
- Temperature effects of crude oil in the upper intertidal zone [PB-255956/5]  
13 p0110 A77-12581
- Possible effects of nuclear initiative on supply and use of electricity in California [AD-A026582]  
13 p0131 A77-15510
- Overview of the Imperial Valley environmental project [UCID-17067]  
13 p0132 A77-15533
- Proceedings of a Symposium on Offshore Oil Potential and Related Land Use Impacts in the Central California Coastal Zone [PB-259074/3]  
14 p0215 A77-18547
- Solar energy in buildings: Implications for California energy policy [NASA-CR-152686]  
15 p0343 A77-22613
- California's energy future [AD-A032221]  
15 p0348 A77-22667
- Control of oxides of sulfur from stationary sources in the south coast air basin of California [PB-261754/6]  
15 p0348 A77-22668
- Geotechnical environmental aspects of geothermal power generation Heber, Imperial Valley, California [PB-260848/7]  
15 p0349 A77-22680
- Telluric mapping over the Mesa Geothermal Anomaly, Imperial Valley, California [PB-262828/7]  
15 p0355 A77-23593
- Santa Clara, California, community center, commercial solar demonstration legal alternatives, implications, and financing of solar heating and cooling by a municipal corporation [SAN/1083-76/1]  
15 p0394 A77-27549
- Energy Technologies for the West: Geothermal; Energy from the earth [TID-27431]  
16 p0537 A77-31642
- Energy Technologies for the West: Can the Individual's Voice be Heard; Public Participation in Energy Planning [TID-27433]  
16 p0537 A77-31643
- Analysis of the California energy industry [LBL-5928]  
16 p0557 A77-33640
- CALORIMETERS**  
Calorimetry of large solar concentrators  
13 p0038 A77-12814
- Differential scanning calorimetry studies on coal. II - Hydrogenation of coals  
13 p0070 A77-18583
- CANADA**  
Can Canada harness the wind  
13 p0053 A77-15047
- The energy situation in Canada  
14 p0165 A77-23307
- Raw materials for energy generation in Canada  
14 p0165 A77-23315
- Overview of Canadian activities in renewable energy resources  
16 p0469 A77-48912
- The climatology of available solar energy for Canada  
16 p0471 A77-48924
- Daedalophobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada  
16 p0494 A77-49121
- Mandatory Canadian crude oil allocation regulations [PB-255319/6]  
13 p0096 A77-11509
- Research and development for Canadian nuclear power [AECL-5314]  
13 p0097 A77-11533
- Energy equivalents for current and prospective automotive fuels in Canada [AD-A026195]  
13 p0124 A77-14609
- Energy self-sufficiency prospects for the British Columbia forest products industry [VP-X-166]  
15 p0363 A77-24591
- CAPACITORS**  
Future space experiments with levitated capacitor for thermonuclear microexplosions [IAF PAPER 77-ST-11]  
16 p0508 A77-51575
- The 275 deg C microcircuitry: Resistors, capacitors, conductors, substrates, and bonding [SAND-76-0611]  
15 p0389 A77-27312
- Design definition of a mechanical capacitor [NASA-CR-152613]  
16 p0552 A77-33603
- CAPILLARY FLOW**  
Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149815]  
14 p0227 A77-19898

Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149814] 14 p0227 N77-19899

**CAPILLARY TUBES**  
Operation peculiarities of low temperature heat pipes with crimped capillary structure 13 p0119 N77-14380

**CARBON**  
Combustion of oil-shale carbon residue 14 p0193 A77-27343  
Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells 16 p0420 A77-44059  
Development of the fluidized-bed carbon-burnup cell 16 p0454 A77-48789  
Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell 16 p0500 A77-50200  
Concurrent carbon gasification and carbon deposition in chars 16 p0508 A77-51590  
The relation between isotopic composition of argon and carbon in natural gases 16 p0531 N77-30680  
[NASA-TN-75134]

**CARBON COMPOUNDS**  
Electric current from the direct conversion of low molecular weight C,H,O-compounds 13 p0055 A77-15814

**CARBON DIOXIDE**  
Air, water, nuclear power make gasoline 13 p0045 A77-12935  
Effects of anthropogenic emissions on climate - A review of selected topics 13 p0067 A77-18295  
Atmospheric carbon dioxide variations at the South Pole 13 p0067 A77-18439  
Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium 14 p0198 A77-28776  
A petroleum substitute - Active CO<sub>2</sub> 14 p0200 A77-29325  
Synthetic carbonaceous fuel and feedstock using nuclear power, air and water 15 p0321 A77-38532  
Can we control the carbon dioxide in the atmosphere 15 p0322 A77-38674  
Synthetic carbonaceous fuels and feedstocks from oxides of carbon and nuclear power 16 p0444 A77-48711  
Reactivity of oil shale carbonaceous residue with oxygen and carbon dioxide [UCRL-77829] 13 p0123 N77-14596

**CARBON DIOXIDE LASERS**  
Some results of MHD-laser investigation 15 p0328 A77-39549  
Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea 16 p0433 A77-47080

**CARBON ISOTOPES**  
Isotopic characterization of Illinois natural gas 13 p0113 N77-13484

**CARBON MONOXIDE**  
COSTEAM: Low-rank coal liquefaction - An updated analysis 13 p0045 A77-12934  
Catalytic coal liquefaction using synthesis gas 13 p0059 A77-16473  
Molecular synthesis in the case of the Fischer-Tropsch synthesis - Reaction steps of the molecular synthesis by means of the catalytic transformation of carbon monoxide and hydrogen 15 p0268 A77-32248  
Synthetic carbonaceous fuels and feedstocks from oxides of carbon and nuclear power 16 p0444 A77-48711  
Development of fuel cell CO detection instruments for use in a mine atmosphere [PB-254823/8] 13 p0095 N77-11380

**CARBON STEELS**  
Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier [PB-268106/2] 16 p0543 N77-32295

**CARBON 14**  
Cooperative geochemical resource assessment of the Mesa Geothermal system [PB-257225/3] 13 p0132 N77-15520

**CARBON-CARBON COMPOSITES**

Experimental screening of carbon-base materials for impact members in isotopic heat sources [BNI-X-673] 15 p0396 N77-27901

**CARBONATES**

Evaporation of solution droplets in a high-temperature medium --- potassium carbonate MHD flow properties 13 p0046 A77-13254

Evaporation of a drop of solution in a high-temperature medium --- potassium carbonate MHD flow properties 15 p0263 A77-31534

Molten carbonate fuel cell model 16 p0447 A77-48737

Reactivity of oil shale carbonaceous residue with oxygen and carbon dioxide [UCRL-77829] 13 p0123 N77-14596

**CARBONIZATION**

Coal gasification --- by destructive distillation and coke residue gasification processes 15 p0262 A77-31471

**CARBURIZING**

Laboratory investigation of high temperature alloy failure mechanisms 15 p0271 A77-32608

**CARGO**

North American freight transportation - Near or incipient chaos 16 p0410 A77-41943

**CARGO AIRCRAFT**

Application of advanced technology to future long-range aircraft [SAWE PAPER 1126] 13 p0016 A77-12194

Design of a large span-distributed load flying-wing cargo airplane [NASA-TN-X-74031] 15 p0353 N77-23089

An evaluation of very large airplanes and alternative fuels [AD-A040532] 16 p0532 N77-31334

**CARNOT CYCLE**

Thermodynamic constraints, effective temperatures and solar cells 14 p0147 A77-21779

Problems relating to heat storage --- at solar thermal power plant 14 p0152 A77-21826

Miniature solar-electric power system 16 p0462 A77-48848

**CASCADE FLOW**

A precise satellite thermal control system using cascaded heat pipes [AIAA PAPER 77-777] 15 p0312 A77-31282

**CASSEGRAIN OPTICS**

A Cassegrain system for solar radiation 13 p0063 A77-17561

Paraboloid-hyperboloid concentrating systems and their accuracy 15 p0286 A77-33433

Paraboloid-hyperboloid concentrating systems and their accuracy 16 p0427 A77-45546

**CATALYSIS**

Catalytic coal gasification for SNG production --- Synthetic Natural Gas 13 p0022 A77-12683

Catalytic coal liquefaction using synthesis gas 13 p0059 A77-16473

A petroleum substitute - Active CO<sub>2</sub> 14 p0200 A77-29325

Molecular synthesis in the case of the Fischer-Tropsch synthesis - Reaction steps of the molecular synthesis by means of the catalytic transformation of carbon monoxide and hydrogen 15 p0268 A77-32248

The oxidant formation potential of emissions from catalyst-equipped vehicles 15 p0333 A77-39596

Catalytic action of combustion-product deposits in the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the combustion chambers and exhaust channels of thermoelectric plants 16 p0420 A77-44179

The electron factor in catalysis on metals electrocatalysis on non-metallic surfaces [PB-256264/3] 13 p0103 N77-12166

## CATALYSTS

- Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems 13 p0064 A77-18019
- Anodic oxidation of ethylene glycol with noble metal alloy catalysts --- in fuel cell 15 p0260 A77-31171
- Emissions and performance of catalysts for gas turbine catalytic combustors [NASA-TN-X-73543] 13 p0104 N77-12406
- Optimization of Pt-doped Kocite (trademark) electrodes in H<sub>2</sub> PO<sub>4</sub> fuel cells [AD-A025326] 13 p0107 N77-12529
- Manufacturing and evaluation of phthalocyanines as catalysts for fuel cells [BMPT-PB-T-76-25] 13 p0114 N77-13540
- Catalytic synthesis of gaseous hydrocarbons [FE-1814-2] 13 p0130 N77-15503
- Surface research for development of new electrocatalysts for acid electrolyte fuel cells [AD-A026053] 13 p0131 N77-15517
- XRF analysis of some regenerated catalysts [MRL-TN-388] 15 p0376 N77-26247
- Durability testing at one atmosphere of advanced catalysts and catalyst supports for automotive gas turbine engine combustors, part 1 [NASA-CR-135132] 16 p0520 N77-29519
- CATALYTIC ACTIVITY**
- Catalytic hydrogenation of solvent-refined lignite to liquid fuels 13 p0008 A77-11243
- Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte 13 p0055 A77-15815
- Batch autoclave studies of catalytic hydrodesulfurization of coal 14 p0145 A77-21617
- Hydrocarbon cracking developments in the DDR 14 p0164 A77-23098
- Kinetics of heterogeneously catalyzed coal hydroliquefaction 14 p0196 A77-28473
- Influence of bonding and filling agents on the activity of tungsten carbide hydrogen electrodes 15 p0260 A77-31173
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 15 p0283 A77-33407
- Automotive sulfate emissions 15 p0290 A77-34629
- Fundamentals of coal liquefaction 15 p0309 A77-36814
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 14 p0245 N77-21645

## CATHODES

- Study of cathode spots in the presence of slag films on the electrodes of an open-cycle MHD generator 13 p0053 A77-15005
- Cathode spots on metallic electrodes of an MHD-channel 15 p0269 A77-32518

## CAVITIES

- Comprehensive ground control study of a mechanized longwall operation. Volume 2: Special reports. 1: Physical properties of coal and coal measure rocks. 2: Bearing capacity of roof and floor rocks. 3: Response of borehole pressure cells. 4: Installation of subsurface instrumentation [PB-262476/5] 15 p0368 N77-24711

## CELL ANODES

- Anodic oxidation of ethylene glycol with noble metal alloy catalysts --- in fuel cell 15 p0260 A77-31171
- Influence of bonding and filling agents on the activity of tungsten carbide hydrogen electrodes 15 p0260 A77-31173
- Hydrogen and electricity from water and light 16 p0430 A77-46609
- N-CdS/n-GaAs voltage-enhanced photoanode --- in photoelectrochemical solar cell 16 p0503 A77-50287
- Electrically rechargeable REDOX flow cell [NASA-CASE-LEW-12220-1] 13 p0121 N77-14581

## CELL CATHODES

- Improved negative electrodes for lithium/iron sulfide batteries 16 p0448 A77-48742

## CELLS (BIOLOGY)

- The palirrhrotrophic origin of energy metabolism --- chemiosmotic precursor to phototropism in estuarine cellular organisms 13 p0064 A77-17895

## CELLULOSE

- Enzymatic hydrolysis of cellulosic wastes to fermentable sugars for alcohol production 15 p0315 A77-37666

## CEMENTS

- Environmental considerations of selected energy conserving manufacturing process options. Volume 10: Cement industry report [PB-264276/7] 15 p0384 N77-26687

## CENTRAL ATLANTIC REGION (US)

- Identification and analysis of mid-Atlantic onshore OCS impact [PB-254925/1] 13 p0096 N77-11516

## CENTRIFUGAL COMPRESSORS

- Improvements in fluid machines and systems for energy conversion. Volume 4 --- Book 15 p0309 A77-36815

## CENTRIFUGAL PUMPS

- The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854
- Improvements in fluid machines and systems for energy conversion. Volume 4 --- Book 15 p0309 A77-36815

## CERAMIC COATINGS

- Selective black absorbers using RF-sputtered Cr<sub>2</sub>O<sub>3</sub>/Cr cermet films 15 p0265 A77-31951
- Effect of ceramic coating of JT8D combustor liner on maximum liner temperatures and other combustor performance parameters [NASA-TN-X-73581] 13 p0126 N77-15037
- Ceramic heat pipe heat exchangers [LA-6514-MS] 15 p0361 N77-24431

## CERAMICS

- High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591
- Ceramic thin film CdTe solar cell 14 p0135 A77-19635
- Progress on the testing of refractories for directly-fired MHD air heater service 14 p0142 A77-21254
- Calculation of thermal stresses in ceramic elements of the refractory channel walls of a magnetohydrodynamic generator 15 p0263 A77-31540
- Corrosion of potential MHD preheater materials in liquid slag and slag-seed 15 p0327 A77-39541
- Generator wall slag coating and material corrosion experiments 15 p0327 A77-39542
- Design and performance of high temperature ceramic electrode modules --- in MHD generators 15 p0327 A77-39543
- Progress on the testing of refractories for directly-fired MHD air heater service. II 15 p0328 A77-39544
- Ceramic materials and components for small automotive gas turbine engine [AD-A025472] 13 p0095 N77-11417
- Analysis of ceramic materials for impact members in isotopic heat sources [BNI-X-670] 14 p0210 N77-17246
- Ceramic applications in the advanced Stirling automotive engine [NASA-TN-X-73632] 15 p0354 N77-23487
- Ceramics for the advanced automotive gas turbine engine: A look at a single shaft design [NASA-TN-X-73651] 15 p0354 N77-23490
- Basic research on ceramic materials for energy storage and conversion systems [COO-2564-2] 16 p0511 N77-28305
- Ceramic coatings for components exposed to coal-gas environments: A review [ANI-76-124] 16 p0532 N77-31323
- Study and program plan for improved heavy duty gas turbine engine ceramic component development [NASA-CR-135230] 16 p0542 N77-32033

## CERMENTS

- Applications of thin graded-index films to solar absorbers 15 p0260 A77-31244
- Selective black absorbers using RF-sputtered Cr2O3/Cr cermet films 15 p0265 A77-31951

## CESIUM

- Results of closed cycle MHD power generation test with a helium-cesium working fluid [NASA-TN-X-73621] 15 p0357 N77-23936

## CESIUM DIODES

- Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies 13 p0018 A77-12361

## CESIUM PLASMA

- Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator [NASA-TN-D-8374] 14 p0213 N77-17852

## CETANE

- An experimental study supported by a computer simulation in a prechamber CFR diesel engine leading to a modified cetane scale for rating low ignition quality fuels 16 p0525 N77-30259

## CHALCOGENIDES

- Thermoelectric power of pseudoternary solid solutions 13 p0014 A77-11917

## CHANNEL FLOW

- Calculation of turbulent magnetohydrodynamic boundary layers in MHD generator channels 13 p0046 A77-13242
- Acoustic properties of subsonic MHD channel 13 p0054 A77-15668
- In-channel observations on coal slag --- in MHD generators 14 p0139 A77-21222
- Progress on the Mark VI long-duration MHD generator 14 p0141 A77-21237
- Consideration of three-dimensional effects in MHD power generators 14 p0142 A77-21261
- Cathode spots on metallic electrodes of an MHD-channel 15 p0269 A77-32518
- Influence of flow nonuniformity on plasma instability at the channel wall 15 p0269 A77-32520
- Investigation of two-dimensional electric effects in a sectional MHD-channel 15 p0317 A77-37930
- Gaseous electrode development at RMC --- for plasma channel operation in MHD generators 15 p0325 A77-39530
- Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser 15 p0326 A77-39532
- Molecular gas performance of a disk generator with swirl 15 p0326 A77-39534
- The influence of the transverse current nonuniformity, caused by current leakages onto the insulating walls of the channel, on the local characteristics of a nonideal MHD generator 15 p0329 A77-39553
- Three dimensional current distribution in diagonal conducting wall channels 15 p0329 A77-39556
- Coupled electrical and fluid calculations in the cross plane in linear MHD generators 15 p0329 A77-39557
- A consideration of some three-dimensional effects in MHD channel 15 p0330 A77-39560
- Subsonic MHD-diffuser performance with high blockage 15 p0331 A77-39567
- Progress in channel development for direct coal fired MHD 16 p0458 A77-48824

## CHARCOAL

- Coal gasification update 15 p0306 A77-36763
- Multi-stage activation of brown-coal chars with oxygen 16 p0401 A77-41319

## CHARGE CARRIERS

- Fundamental electronic mechanisms limiting the performance of solar cells 15 p0257 A77-30710
- Efficiency calculations for Al/x/Ga/1-x/As-GaAs heteroface solar cells 15 p0257 A77-30720

## CHARGED PARTICLES

- Charge characteristics of particles in coal derived liquids - Measurement and origin 16 p0412 A77-42408

## CHEMICAL ANALYSIS

- Characterization of synthetic liquid fuels --- analytical separation and spectroscopic techniques 14 p0169 A77-23554
- Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- MHD combustor effluent chemistry measurements using Raman scattering 16 p0425 A77-44825
- The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study 16 p0438 A77-47765
- Theoretical, numerical, and physical techniques for characterizing power plant plumes [PB-253099/6] 13 p0101 N77-11599
- Fuel contaminants. Volume 1: Chemistry [PB-256020/9] 13 p0103 N77-12231
- Environmental assessment sampling and analytical strategy program --- industrial wastes [PB-261259/6] 15 p0352 N77-23021
- Approaches to chemical class analyses of fossil derived materials [CONF-770301-5] 16 p0532 N77-31271
- Chemical characterization of diesel exhaust particulates [PERC/RI-77/5] 16 p0540 N77-31671
- Large scale scientific computation via minicomputer [PB-267575/9] 16 p0541 N77-31823

## CHEMICAL CLEANING

- Chemical cleaning of coal [ASME PAPER 76-WA/APC-2] 14 p0184 A77-26409

## CHEMICAL COMPOSITION

- Organization of long range transport of air pollution monitoring in Europe 13 p0071 A77-18754
- Composition and size distribution of in-stack particulate material at a coal-fired power plant 14 p0139 A77-21018
- Batch autoclave studies of catalytic hydrosulfurization of coal 14 p0145 A77-21617
- Details of hydrogen-burning thermonuclear reactions 14 p0168 A77-23457
- Development of the modified in situ oil-shale process 14 p0193 A77-27342

## CHEMICAL COMPOUNDS

- Enhanced energy utilization from a controlled thermonuclear fusion reactor [PB-260653/1] 14 p0234 A77-20879

## CHEMICAL EFFECTS

- Desulfurization of coal by use of chemical comminution 16 p0418 A77-43009

## CHEMICAL ENERGY

- Photoassisted electrolysis of water - Conversion of optical to chemical energy 13 p0021 A77-12666
- Thermochemical energy storage systems 13 p0028 A77-12738
- Operational chemical storage cycles for utilization of solar energy to produce heat or electric power 14 p0158 A77-22646
- Exergy considerations related to the acquisition, supply, and utilization of solar energy 14 p0203 A77-29572
- Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process 15 p0267 A77-32247
- Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344



# SUBJECT INDEX

# CHEMILUMINESCENCE

Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
15 p0279 A77-33374

Ocean thermal energy delivery systems based on chemical energy carriers  
15 p0279 A77-33375

ERDA's Chemical Energy Storage Program  
16 p0450 A77-48763

Evaluation of a chemical heat storage system for a solar steam power plant  
16 p0460 A77-48840

Application of chemical engineering to large scale solar energy  
16 p0491 A77-49098

Chemical methods of storing thermal energy  
16 p0491 A77-49100

Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles  
[DLR-PB-76-32] 13 p0114 A77-13541

Study of the application of solar chemical dehumidification system to wind tunnel facilities of NASA Lewis Research Center at Cleveland, Ohio  
[NASA-CR-149886] 14 p0227 A77-20116

Ocean thermal energy delivery systems based on chemical energy carriers  
14 p0240 A77-21609

Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles  
[ESA-TT-338] 14 p0251 A77-21701

**CHEMICAL ENGINEERING**

Design analyses of a methane-based chemical heat pipe  
13 p0028 A77-12737

On the production of town gas from off-gases of the chemical processing industry  
14 p0164 A77-23099

Coal gasification --- by destructive distillation and coke residue gasification processes  
15 p0262 A77-31471

Methanol, past, present, and speculation on the future --- manufacture techniques and fuel applications  
15 p0289 A77-34114

Energy use patterns in metallurgical and nonmetallurgical mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement  
[PB-261153/1] 15 p0346 A77-22645

Chemical engineering side of nuclear fusion power  
[PPPL-1303] 15 p0376 A77-25965

Development of high stability fuel. Executive summary  
[AD-A039977] 16 p0533 A77-31339

**CHEMICAL EVOLUTION**

Chemical evolution of photosynthesis  
13 p0071 A77-18898

**CHEMICAL EXPLOSIONS**

Thermal explosion of moving reacting fluids of variable viscosity  
13 p0052 A77-14980

**CHEMICAL FRACTIONATION**

Hydrocarbon cracking developments in the DDR  
14 p0164 A77-23098

Fracturing oil shale with explosives for in situ recovery  
14 p0169 A77-23559

Coal particle integrity in high-temperature solvents, with and without agitation  
16 p0401 A77-41317

**CHEMICAL FUELS**

Shale oil, tar sands, and related fuel sources --- Book  
14 p0169 A77-23551

Fuels via bioconversion  
14 p0176 A77-24569

Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process  
15 p0267 A77-32247

**CHEMICAL PROPERTIES**

The influence of the properties of coals on their conversion into clean fuels  
13 p0009 A77-11245

Some properties of coal slags of importance to MHD  
15 p0330 A77-39563

Antiwear additives, wear studies on chemical addition agents for imparting an effective lubricating response in polysiloxane (silicone) fluids  
[AD-A033527] 15 p0340 A77-22270

**CHEMICAL PROPULSION**

Near-term chemically-propelled space transport systems --- to space colonies  
15 p0295 A77-35810

**CHEMICAL REACTION CONTROL**

Balance and optimization procedure for thermochemical cycles for hydrogen production  
15 p0276 A77-33345

**CHEMICAL REACTIONS**

Study of the ionization of the additive in MHD installations  
13 p0002 A77-10424

Thermochemical energy storage systems  
13 p0028 A77-12738

Energy storage via calcium hydride production  
13 p0032 A77-12774

Hydrogen production from water by means of chemical cycles  
13 p0058 A77-16471

Progress in the Los Alamos Scientific Laboratory Program to develop thermochemical processes for hydrogen production  
15 p0275 A77-33341

Discovery of reaction sequences for thermochemical water splitting --- in hydrogen production cycles  
15 p0275 A77-33343

Mathematical method for determining reaction networks in chemical systems  
16 p0418 A77-43093

Energy corradation using the reversible ammonia reaction --- for solar power generation  
16 p0422 A77-44483

Chemical methods of storing thermal energy  
16 p0491 A77-49100

Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir  
[PB-262391/6] 14 p0252 A77-21731

Geothermal chemistry activities at LASL  
[LA-6448-PR] 15 p0344 A77-22623

**CHEMICAL REACTORS**

Hydrogen production by the steam-iron process  
13 p0023 A77-12688

Operation of the Westinghouse Coal Gasification Process Development Unit  
13 p0023 A77-12689

A combined cycle with a partial-oxidation reactor  
13 p0062 A77-17534

Upgrading coal liquids to gas turbine fuels. III - Exploratory process studies  
14 p0178 A77-24853

The concept of 'nuclear hydrogen production' and progress of work in the Nuclear Research Center Juelich  
15 p0273 A77-33328

Flash hydrolysis process for conversion of lignite to liquid and gaseous products  
15 p0301 A77-36334

Advanced gasification technologies  
15 p0308 A77-36811

Gasification and generation of electricity --- coal utilization  
15 p0308 A77-36812

Producer gas from agricultural wastes - Its production and utilization in a converted oil-fired boiler  
15 p0323 A77-39106

Development of the Westinghouse coal gasification process - A status report  
16 p0446 A77-48722

Catalytic synthesis of gaseous hydrocarbons  
[FE-1814-2] 13 p0130 A77-15503

**CHEMILUMINESCENCE**

Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer  
13 p0062 A77-17541

## CHILE

LANDSAT (ERTS) used as a basis for geological  
volcanological mapping in the central Andes  
[NASA-TM-75024] 15 p0390 N77-27474

## CHINESE PEOPLES REPUBLIC

China claims lead in biogas energy supply  
15 p0297 A77-36050

## CHLORIDES

Aerosol formation during coal combustion -  
Condensation of sulfates and chlorides on flyash  
13 p0054 A77-15778

Engineering design and cost analysis of chlorine  
storage concepts for a zinc-chlorine  
load-leveling battery  
[PB-262016/9] 14 p0252 N77-21727

## CHLORINE

A hydrogen-halogen energy storage system for  
electric utility applications 16 p0457 A77-48818

Evaluation of a 1 kWh zinc chloride battery system  
[PB-260683/8] 14 p0236 N77-21356

Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur families 14 p0238 N77-21572

Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689

## CHLOROPLASTS

Biological solar energy conversion: Approaches to  
overcome yield, stability and product limitations  
[PB-261910/4] 15 p0350 N77-22688

Biological solar energy conversion: Approaches to  
overcome yield, stability and product limitations  
[PB-267937/1] 16 p0554 N77-33619

## CHROMATOGRAPHY

Chromatographic determination of adsorption and  
diffusion in a bidispersed porous solid  
[LBL-5273] 16 p0532 N77-31269

## CHROMIUM

A new Chrome Black selective absorbing surface ---  
for solar radiation 16 p0406 A77-41585

Fundamental studies of black chrome for solar  
collector use 16 p0498 A77-49160

## CHROMIUM ALLOYS

Metal dusting corrosion in coal gasification  
environments 15 p0337 A77-40042

## CHROMIUM OXIDES

Selective black absorbers using RF-sputtered  
Cr2O3/Cr cermet films 15 p0265 A77-31951

The optical properties of chromium oxide films and  
the high temperature stabilization of silver  
films for photothermal solar energy conversion  
13 p0128 N77-15484

## CIRCUIT RELIABILITY

Cooling arrays of circuit cards using heat pipes  
and forced air diffusers 13 p0031 A77-12766

Research and development of cryoalternators for  
large-electrical power systems 14 p0190 A77-26536

## CISLUNAR SPACE

Environmental impact of space manufacturing  
[AIAA PAPER 77-539] 15 p0266 A77-32062

## CITIES

Evolution of atmospheric pollution /high acidity  
and black fumes/ in France during 1975  
13 p0002 A77-10670

Assessing the relationship between urban form and  
travel requirements: A literature review and  
conceptual framework  
[PB-254588/9] 13 p0102 N77-11923

Improved engineering-economic model of residential  
energy use  
[ORNL-COM-8] 16 p0557 N77-33644

## CIVIL AVIATION

Our amazing air transportation system /AIAA-SAE  
William Littlewood Memorial Lecture/ --- civil  
aviation aircraft historical overview  
[AIAA PAPER 77-356] 13 p0067 A77-18260

The seat belt light is on --- airline industry  
economic assessment and forecasts 13 p0080 A77-19175

The competitive market for commercial VSTOL  
[AIAA 77-573] 15 p0290 A77-34933

Energy utilization factor in civil transport  
aircraft 15 p0307 A77-36788

A view of the future - Constraints and opportunities  
--- aviation effects on world structure  
16 p0410 A77-41944

Future aircraft requirements: A notebook of  
airline thoughts 13 p0117 N77-13976

Air transport propulsion for the 1980's  
13 p0117 N77-13980

Aviation economics --- commercial airlines  
[GPO-73-830] 15 p0352 N77-23008

## CLASSIFICATIONS

Classification of oils by the application of  
pattern recognition techniques to infrared spectra  
[AD-A039387] 16 p0531 N77-30841

## CLEAN ENERGY

Low-sulfur coal obtained by chemical  
desulfurization followed by liquefaction  
13 p0008 A77-11242

Evaluation of coal liquefaction efficiency based  
on various ranks 13 p0009 A77-11244

The influence of the properties of coals on their  
conversion into clean fuels 13 p0009 A77-11245

Solids gasification for gas turbine fuel 100 and  
300 Btu gas 13 p0022 A77-12685

Low-Btu gasification of coal by Atomics  
International's molten salt process 13 p0023 A77-12687

Wind energy for human needs 14 p0145 A77-21400

Direct and indirect economics of wind energy  
systems relative to fuel based systems 14 p0165 A77-23358

Balancing power supply from wind energy converting  
systems 14 p0166 A77-23361

Clean fuels from biomass 14 p0167 A77-23390

Fuel cells - A sleeper in the energy race  
14 p0170 A77-23647

Why solar energy --- advantages over fossil fuel  
and nuclear energy 14 p0170 A77-23654

Energy from the wind 14 p0179 A77-25575

Coal gasifier projects gather momentum  
14 p0184 A77-26290

Underground gasification offers clean safe route  
to coal energy 14 p0184 A77-26292

Applicability of the Meyers Process for  
desulfurization of U.S. coal /A survey of 35  
coal mines/ 14 p0191 A77-27278

SO2 control technologies - Commercial  
availabilities and economics 14 p0191 A77-27279

A new concept for the manufacture of low sulfur  
fuels and chemicals from coal 14 p0192 A77-27295

Prospects for pipeline delivery of hydrogen as a  
fuel and as a chemical feedstock 14 p0200 A77-29437

Hydrogen energy - Its potential promises and  
problems 15 p0284 A77-33410

Clean energy from Alaskan coals 15 p0301 A77-36333

The IGT low-Btu gas process - Design and economics  
--- clean fuel gas from coal 15 p0301 A77-36335

Winkler technology for clean fuels from coal  
15 p0301 A77-36337

Preliminary economic analysis - Oil and power by  
COED-based coal conversion 15 p0301 A77-36338

Clean fuels from biomass, sewage, urban refuse,  
agricultural wastes; Proceedings of the  
Symposium, Orlando, Fla., January 27-30, 1976  
15 p0313 A77-37652

- COGAS status report --- coal processing for clean liquid and gas fuels 15 p0317 A77-38100
- The prospects for renewable energy sources 16 p0415 A77-42858
- Wind energy - Bounty in the breeze 16 p0418 A77-43123
- Solar energy in Australia 16 p0426 A77-45499
- Underground coal gasification --- Book 16 p0428 A77-45954
- Symposium on Clean Fusion, 1st, Washington, D.C., April 30, 1976, Proceedings 16 p0435 A77-47355
- Clean fusion concepts and efforts - A survey 16 p0435 A77-47356
- Advanced fuel nuclear reaction feasibility using laser compression. I 16 p0435 A77-47358
- Advanced fuel nuclear reaction feasibility using laser compression. II 16 p0435 A77-47359
- ERDA fuel cell programs 16 p0447 A77-48734
- 4.8-megawatt fuel cell module demonstrator 16 p0447 A77-48738
- Application of chemical engineering to large scale solar energy 16 p0491 A77-49098
- Solar energy: A U.K. assessment --- Book 16 p0503 A77-50688
- Comparison of different wind energy conversion systems. Part 1: The NOAA system compared with the Ulrich BUTTER system [RFP-TRANS-204-PT-1] 15 p0346 N77-22637
- NASA Quiet Clean General Aviation Turbofan (QCGAT) program status [NASA-TM-X-73564] 15 p0353 N77-23109
- Static and wind-on tests of an upper-surface-blown jet-flap nozzle arrangement for use on the Quiet Clean Short-haul Experimental Engine (QCSE) [NASA-TN-D-8476] 15 p0370 N77-25086
- CLEANING**
- Investigation of the mechanism of cleaning heating surfaces by the pulsation method [BLL-M-25448-(5828.4F)] 13 p0112 N77-13235
- CLIMATE**
- Weather, climate and human settlements [WMO-448] 15 p0387 N77-27038
- CLIMATOLOGY**
- The consideration of climatic data in the prediction of solar-system performance --- for energy conversion 14 p0202 A77-29569
- The test reference year: A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun --- for heating and air conditioning systems design 16 p0441 A77-48258
- The climatology of available solar energy for Canada 16 p0471 A77-48924
- Climate based solar house design - Hot and humid Charleston, S.C. 16 p0478 A77-48991
- Climatological constraints on the development of solar energy in Canada 16 p0480 A77-49005
- Introductory remarks on space observations of long-term climatic changes produced by escalating energy use [IAF PAPER A-77-01] 16 p0507 A77-51508
- CLIMBING FLIGHT**
- Best-range flight conditions for cruise-climb flight of a jet aircraft 13 p0085 N77-10379
- CLOSED CYCLES**
- System studies of coal fired-closed cycle MHD for central station power plants 13 p0034 A77-12786
- System studies of coal fired-closed cycle MHD for central station power plants 14 p0142 A77-21267
- Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process 15 p0276 A77-33350
- Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353
- Closed Brayton cycle turbines for satellite solar power stations 15 p0296 A77-35816
- Design of closed-cycle MHD generator with nonequilibrium ionization and system 15 p0303 A77-36381
- The OTEC answer to OPEC - Solar sea power 15 p0303 A77-36409
- Results of closed cycle MHD power generation tests with a helium-cesium working fluid 15 p0326 A77-39533
- Argon contamination associated with ceramic regenerative heat exchangers for closed cycle MHD 15 p0326 A77-39536
- Coal fired non-equilibrium closed cycle MHD power plant system since ECAS --- Energy Conversion Alternatives Study 15 p0332 A77-39576
- Closed Brayton cycle using hydrogen as a work fluid [BNL-20899] 13 p0085 N77-10542
- CLOUD COVER**
- A method for estimating hourly averages of diffuse and direct solar radiation under a layer of scattered clouds --- for solar collector design 13 p0019 A77-12412
- Meteorological effects on solar cells 15 p0338 A77-40149
- COAL**
- The availability of fuels for power plants 13 p0010 A77-11316
- Assessing low sulfur coal resources in Montana and Wyoming 13 p0058 A77-16374
- Production of atmospheric nitrous oxide by combustion 13 p0061 A77-16922
- Composition and size distribution of in-stack particulate material at a coal-fired power plant 14 p0139 A77-21018
- Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels 14 p0177 A77-24852
- Upgrading coal liquids to gas turbine fuels. III - Exploratory process studies 14 p0178 A77-24853
- Some properties of coal slags of importance to MHD 15 p0330 A77-39563
- Effects of coal mining on ground and surface water quality, Monongalia County, West Virginia 16 p0400 A77-41211
- Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal 16 p0442 A77-48489
- Utilizing methane from coalbeds 16 p0444 A77-48710
- Pressurized fluidized-bed coal combustion 16 p0454 A77-48788
- Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- Dynamic modeling of fluidized bed boilers for control system design 16 p0454 A77-48792
- Fluidized-bed combustion of anthracite refuse 16 p0454 A77-48793
- National Emissions Data Systems (NEDS) fuel use report, 1973 [PB-253908/8] 13 p0083 N77-10220
- Development of signal processing algorithms for ultrasonic detection of coal seam interfaces [NASA-CR-150024] 13 p0085 N77-10610
- The long-run marginal costs of energy [PB-252504/6] 13 p0085 N77-10625
- The supply of coal in the long run: The case of eastern deep coal [PB-252642/4] 13 p0086 N77-10626
- Underground coal mining: An assessment of technology [PB-255726/2] 13 p0093 N77-10974
- Methanol from coal fuel and other applications [ORAU-126] 13 p0094 N77-11200
- Applying computer-drawn maps of geologic data to analysis of mining problems [PB-255497/0] 13 p0096 N77-11518

- The air quality and economic implications of supplementary control systems in Illinois --- considering electric power plant fuels [PB-255699/1] 13 p0101 N77-11588
- An application of ERTS technology to the evaluation of coal strip mining and reclamation in the northern Great Plains [NASA-CR-149208] 13 p0104 N77-12486
- Laws and regulations affecting coal with summaries of Federal, State, and local laws and regulations pertaining to air and water pollution control, reclamation, diligence and health and safety, part 1 [PB-255927/6] 13 p0110 N77-12592
- Laboratory analysis of solvent refined coal [PB-255550/6] 13 p0110 N77-12598
- Availability of potential coal supply through 1985 by quality characteristics [PB-256680/0] 13 p0121 N77-14573
- Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls [NASA-TN-D-8396] 14 p0207 N77-16445
- Degasification and production of natural gas from an airshaft in the Pittsburgh coalbed [PB-258101/5] 14 p0210 N77-17555
- Production and consumption of coal, 1976 - 1980 [PB-257441/6] 14 p0212 N77-17593
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [PB-2307-2] 14 p0224 N77-19637
- Combustion rates and mechanisms of pulverized coals and coal-derived fuels [SAND-76-8229] 14 p0224 N77-19638
- The spatial characteristics of three Wyoming fuels [AD-A03C873] 14 p0233 N77-20612
- Potential for producing and marketing gasoline substitutes from western coal [BNWL-2080(RAP-4)] 15 p0340 N77-22291
- Historical trends in coal utilization and supply [PB-261278/6] 15 p0341 N77-22295
- Size distribution and mass output of particulates from diesel engine exhausts [PB-261416/2] 15 N77-22732
- Assessment application for direct coal combustion [PB-263651/2] 15 p0359 N77-24318
- Comprehensive ground control study of a mechanized longwall operation. Volume 2: Special reports. 1: Physical properties of coal and coal measure rocks. 2: Bearing capacity of roof and floor rocks. 3: Response of borehole pressure cells. 4: Installation of subsurface instrumentation [PB-262476/5] 15 p0368 N77-24711
- Thermal stability of some aircraft turbine fuels derived from oil shale and coal [NASA-TN-X-3551] 15 p0370 N77-25345
- Evaluation of current surface coal mining overburden handling techniques and reclamation practices [PB-264111/6] 15 p0372 N77-25625
- Electric utility coal consumption and generation trends, 1976-1985 [PB-262483/1] 15 p0374 N77-25667
- CDIF combustor design [TID-27143] 15 p0377 N77-26393
- Internalizing social costs in power plant siting: Some examples for coal and nuclear plants in the United States [CONF-761103-16] 15 p0386 N77-26816
- Technology and use of low-rank coals in the USA [CONF-76C495-1] 15 p0392 N77-27519
- Energy and US agriculture. 1974 data base, volume 1. Part A: US series of energy tables. Part B: State series of energy tables [PB-264449/0] 15 p0395 N77-27562
- TRW 25 MW/sub T/staged MHD coal combustor conceptual design study [TID-27145] 15 p0396 N77-27922
- Long-term natural resource availability: Environmental and political implications in the United States [PB-265762/5] 16 p0511 N77-28327
- Borehole hydraulic coal mining system analysis [NASA-CR-154119] 16 p0512 N77-28558
- Sampling strategy and characterization of Potential Emissions from Synfuel Production Symposium [CONF-760602] 16 p0515 N77-28603
- FEA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers [PB-265706/2] 16 p0517 N77-28615
- Project Independence Evaluation System (PIES) documentation. Volume 13: Coal and electric utility conventions for PIES [PB-265824/3] 16 p0519 N77-29326
- Forecast of likely US energy supply/demand balances for 1985 and 2000, and implications for US energy policy [PB-266240/1] 16 p0523 N77-29633
- Analysis of energy projections for infrastructure development requirements [PB-266419/1] 16 p0524 N77-29640
- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] 16 p0527 N77-30589
- Physical properties of western coal waste materials [PB-266724/4] 16 p0530 N77-30657
- Chromatographic determination of adsorption and diffusion in a bidispersed porous solid [LBL-5273] 16 p0532 N77-31269
- Alluvial valley floors in east-central Montana and their relation to strippable coal reserves. A reconnaissance report [PB-267280/6] 16 p0540 N77-31725
- Computer graphics demonstration: Area coal availability studies [PB-267923/1] 16 p0541 N77-31824
- Systems studies of energy conservation: Methane produced from coalbeds, volume 1 [MERC/CR-77/4-VOL-1] 16 p0558 N77-33660
- COAL GASIFICATION**
- Energy and the gas industry 13 p0005 A77-11032
- Remote sensing of an underground coal-burn cavity with a wide-band induction system 13 p0007 A77-11050
- Prospects for coal as a direct fuel and its potential through application of liquefaction and gasification technology 13 p0008 A77-11241
- Catalytic coal gasification for SNG production --- Synthetic Natural Gas 13 p0022 A77-12683
- Recovery of inaccessible coal reserves by in situ gasification 13 p0022 A77-12686
- Low-Btu gasification of coal by Atomics International's molten salt process 13 p0023 A77-12687
- Operation of the Westinghouse Coal Gasification Process Development Unit 13 p0023 A77-12689
- Diversification as an energy conservation strategy 13 p0027 A77-12725
- The potential of the heat pipe in coal gasification processes 13 p0031 A77-12763
- Heat pipes for fluid-bed gasification of coal - Metallurgical condition of heat pipes after tests in process environment 13 p0031 A77-12764
- The commercial production of hydrogen by the K-T process 13 p0032 A77-12769
- Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770
- Underground gasification of coal: A National Coal Board reappraisal. 1976 --- Book 13 p0044 A77-12926
- Combination power plants for improved utilization of fossil fuels 13 p0045 A77-12939
- Combined cycles and refined coal --- gasification plant using high temperature gas turbines 13 p0058 A77-16249
- Water requirements for an integrated SNG plant and mine operation 13 p0060 A77-16651
- Superalloys for advanced energy systems 13 p0061 A77-16824
- Differential scanning calorimetry studies on coal. II - Hydrogenation of coals 13 p0070 A77-18583

- Coal gasification and its relation to tested power plants 14 p0136 A77-20074
- Effects of devolatilization kinetics and ash behavior on coal fired MHD combustor design 14 p0141 A77-21248
- Applications of the rapid devolatilization of coal in MHD power cycles 14 p0141 A77-21249
- Mathematical simulation of the fixed-bed pressurized gasification process 14 p0164 A77-23097
- How six coal gasification processes compare economically 14 p0165 A77-23308
- Low-Btu gas from coal has many potential markets 14 p0165 A77-23309
- Coal - The fossil energy source for the transition period 14 p0167 A77-23392
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0171 A77-23718
- Future energy production systems: Heat and mass transfer processes. Volume 2 --- Book 14 p0174 A77-24201
- Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors 14 p0175 A77-24210
- Gasification of coal in high-velocity fluidized beds 14 p0175 A77-24211
- Analysis of coal particles undergoing rapid pyrolysis --- in gasification and liquefaction processes 14 p0175 A77-24212
- Gasification of Rhenish brown coal as mined 14 p0175 A77-24213
- Design studies of the hydrogasification of coal 14 p0175 A77-24214
- Coal gasifier projects gather momentum 14 p0184 A77-26290
- Underground gasification offers clean safe route to coal energy 14 p0184 A77-26292
- Recent tests of industrial gas turbine combustors fueled with simulated low heating value coal gas [ASME PAPER 76-WA/GT-3] 14 p0185 A77-26459
- The status of instrumentation and process control techniques for in situ coal gasification 14 p0191 A77-26790
- Dilute-phase hydrogasification process for SNG production 14 p0191 A77-27277
- Applications of the Woodall-Duckham two stage coal gasification 14 p0191 A77-27284
- Fluidised coal combustion - What can be done now 14 p0191 A77-27285
- The SYNTHANE process - Current status --- coal gasification 14 p0192 A77-27286
- Environmental aspects of coal conversion plant siting and cost of pollution control 14 p0192 A77-27293
- HYGAS process update --- hydrogen gasification of coal 14 p0192 A77-27296
- The Riley-Morgan gasifier 14 p0193 A77-27298
- Mobil process for the conversion of methanol to gasoline 14 p0193 A77-27299
- Current status of the BI-GAS process 14 p0193 A77-27300
- Underground gasification of coal 14 p0198 A77-28759
- Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium 14 p0198 A77-28776
- Reactivity heat-treated coals in hydrogen --- for synthetic methane production 14 p0198 A77-28777
- Gasification of coals treated with non-aqueous solvents. I - Liquid ammonia treatment of a bituminous coal 14 p0198 A77-28778
- Coal devolatilization and hydrogasification 14 p0200 A77-29450
- Hydrogenation of lignite with synthesis gas 14 p0201 A77-29525
- New hydrogen process is in the works 14 p0205 A77-29789
- Methanol - A clean burning fuel for automobile engines 14 p0205 A77-29930
- Applications of fluidized beds in coal technology 15 p0262 A77-31470
- Coal gasification --- by destructive distillation and coke residue gasification processes 15 p0262 A77-31471
- Gas economy - Gas technology --- energy supply and utilization 15 p0263 A77-31576
- Considerations on coal gasification 15 p0266 A77-32169
- Synthesis of substitute natural gas on the basis of coal 15 p0268 A77-32249
- The manufacture of hydrogen from coal 15 p0275 A77-33337
- The K-T process - Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 15 p0275 A77-33338
- Economic comparison of synthetic fuels - Gasification and liquefaction 15 p0300 A77-36329
- Evaluation of the Lawrence Livermore Laboratory in-situ coal gasification concept 15 p0300 A77-36332
- Flash hydrolysis process for conversion of lignite to liquid and gaseous products 15 p0301 A77-36334
- The IGT low-Btu gas process - Design and economics --- clean fuel gas from coal 15 p0301 A77-36335
- Fuel gas production via Koppers-Totzek gasification - An economic analysis 15 p0301 A77-36336
- Winkler technology for clean fuels from coal 15 p0301 A77-36337
- Economics of ethylene production via pyrolysis of coal based Fischer-Tropsch hydrocarbons 15 p0301 A77-36339
- Technology and economics of industrial fuel gas from coal 15 p0302 A77-36342
- Coal gasification update 15 p0306 A77-36763
- Factors influencing the economics of large-scale in situ coal gasification operations 15 p0306 A77-36765
- Direct production of methane and benzene from coal 15 p0306 A77-36766
- Symposium on Gasification and Liquefaction of Coal, Dueseldorf, West Germany, January 12-16, 1976, Reports 15 p0307 A77-36806
- North American views of energy choices for the future particularly fluid fuels synthesized from coal 15 p0307 A77-36807
- Trends in western Europe --- lignite gasification cost effectiveness 15 p0308 A77-36808
- Fundamentals of coal gasification 15 p0308 A77-36809
- Conventional gasification technologies 15 p0308 A77-36810
- Advanced gasification technologies 15 p0308 A77-36811
- Gasification and generation of electricity --- coal utilization 15 p0308 A77-36812
- Underground gasification --- of coal for deep deposit in situ processing 15 p0308 A77-36813
- Coal gasification power generation 15 p0310 A77-37000
- COGAS status report --- coal processing for clean liquid and gas fuels 15 p0317 A77-38100

- Progress on the selective removal of H<sub>2</sub>S from gasified coal using an immobilized liquid membrane 15 p0318 A77-38146
- A review of gasification for power generation 15 p0322 A77-38790
- Materials consideration for the Bigas coal gasification pilot plant [ASME PAPER 76-PVP-41] 15 p0323 A77-38825
- Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems 15 p0337 A77-40028
- Corrosion behavior of materials for coal-gasification applications 15 p0337 A77-40029
- Metal dusting corrosion in coal gasification environments 15 p0337 A77-40042
- Modelling of entrained-bed pulverized coal gasifiers 16 p0401 A77-41321
- Gasification - Theory and application --- of coal 16 p0402 A77-41448
- An engineering, geological and hydrological environmental assessment of a 250 MMSCFD dry ash Lurgi coal gasification facility 16 p0418 A77-43143
- Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers [WSS/CI PAPER 76-25] 16 p0419 A77-43593
- What's holding up coal gasification 16 p0423 A77-44522
- Underground coal gasification --- Book 16 p0428 A77-45954
- Numerical model of coal gasification in a packed bed 16 p0440 A77-48175
- Kinetics of gasification in a combustion pot - A comparison of theory and experiment 16 p0440 A77-48176
- Reaction rate analysis of borehole 'in-situ' gasification systems 16 p0440 A77-48177
- Environmental aspects of low Btu gas combustion --- nitrogen oxide emissions from power plants 16 p0440 A77-48178
- Underground coal gasification - A status report 16 p0441 A77-48473
- BI-gas pilot plant processes 5 tph --- bituminous coal gasification 16 p0441 A77-48478
- Development of the Westinghouse coal gasification process - A status report 16 p0446 A77-48722
- Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723
- Coal gasification combined-cycle pilot plant system analysis 16 p0446 A77-48724
- An environmental assessment of a 638 MWe molten carbonate fuel cell power plant 16 p0453 A77-48781
- Hydrogen separation and production from coal-derived gases using Fe/x/TiNi/1-x/ 16 p0458 A77-48821
- A technical scale gas generator for steam gasification of coal using nuclear heat 16 p0502 A77-50255
- Improvements in energy conversion technology 16 p0505 A77-51154
- The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology 16 p0505 A77-51156
- Technical, economic, and environmental evaluation of in situ coal gasification 16 p0506 A77-51366
- Concurrent carbon gasification and carbon deposition in chars 16 p0508 A77-51590
- The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification [ASME PAPER 77-JPGC-GT-7] 16 p0509 A77-51624
- Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors [INIS-MP-1965] 13 p0084 A77-10228
- Advanced coal gasification system for electric power generation --- pollution monitoring [FE-1514-176] 13 p0088 A77-10653
- Handbook of gasifiers and gas treatment systems [FE-1772-11] 13 p0088 A77-10658
- Underground fuel gasification [UCRL-TRANS-10998] 13 p0088 A77-10659
- Reductant gases for flue gas desulfurization systems [PB-254168/8] 13 p0092 A77-10722
- Computer modeling of coal gasification reactors [FE-1770-8] 13 p0093 A77-10812
- Basic studies of coal pyrolysis and hydrogasification [PB-254878/2] 13 p0096 A77-11511
- Problems and solutions in the use of coal analyses [FE-0390-1] 13 p0097 A77-11535
- The use of an interactive energy model for technology assessment with special reference to underground coal gasification [PB-255543/1] 13 p0098 A77-11545
- Draft environmental assessment of application by ERDA for a special land use permit for use of public lands in Wyoming for in situ coal gasification experiments [UCID-17011] 13 p0100 A77-11572
- Environmental impact studies related to underground coal gasification [TID-27003] 13 p0100 A77-11573
- Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization [PB-254166/2] 13 p0101 A77-11581
- Preliminary economics and comment: In-situ gasification of coal for power and SNG [PB-256034/0] 13 p0109 A77-12554
- Outlook for research and development in the underground gasification of coal [PB-256155/3] 13 p0109 A77-12555
- High temperature gas turbine engine [FE-1765-8] 13 p0120 A77-14488
- Evaluation of pollution control in fossil fuel conversion processes [PB-255842/7] 13 p0125 A77-14638
- Coal gasification commercial concepts: Gas cost guidelines [FE-1235-1] 13 p0130 A77-15500
- Development work for an advanced coal gasification system for electric power generation from coal directed toward a commercial gasification generating plant, phase 2 [FE-1521-13] 13 p0130 A77-15501
- Preliminary design services coal conservation demonstration plants [FE-1775-3] 13 p0130 A77-15502
- Catalytic synthesis of gaseous hydrocarbons [FE-1814-2] 13 p0130 A77-15503
- Branched thermocouple circuits in underground coal gasification experiments [SAND-75-5910] 13 p0130 A77-15504
- Hot and dry char let down system for the Synthane demonstration plant, phase 1 [PERC-0058-4] 13 p0130 A77-15505
- Fuel gas environmental impact [PB-257134/7] 14 p0209 A77-16470
- Recovery of inaccessible coal reserves by in situ gasification [CONF-760906-5] 14 p0224 A77-19636
- Production of ammonia using coal as a source of hydrogen [PB-259388/7] 14 p0233 A77-20613
- The manufacture of hydrogen from coal 14 p0237 A77-21566
- The K-T process: Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 14 p0237 A77-21567
- Hydrogen production from coal using a nuclear heat source 14 p0238 A77-21568
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0243 A77-21627
- Hydrogen production from coal liquefaction residues [PB-261734/8] 15 p0350 A77-22687
- Initial environmental test plan for source assessment of coal gasification [PB-261916/1] 15 p0350 A77-22705

- Projects to expand fuel sources in eastern states:  
Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976)  
[PB-262361/9] 15 p0374 N77-25669
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary  
[NASA-CR-134949-VOL-1] 15 p0379 N77-26631
- Energy Conversion Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach  
[NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles  
[NASA-CR-134949-VOL-2-PT-2] 15 p0379 N77-26633
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 3: Open cycle gas turbines and open cycle MHD  
[NASA-CR-134949-VOL-2-PT-3] 15 p0379 N77-26634
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results  
[NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment  
[NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment  
[NASA-CR-134955] 15 p0380 N77-26637
- Utilization of low and intermediate BTU gas from coal for iron ore pelletizing  
[PB-264702/2] 15 p0389 N77-27247
- Prevention of Failures in Coal Conversion Systems: Proceedings of the 24th Meeting of the Mechanical Failures Prevention Group  
[PB-265552/0] 15 p0395 N77-27563
- National gas survey. Report to the federal power commission by the Supply-Technical Advisory Task force on the regulatory aspects of substitute gas  
[PB-265877/1] 16 p0519 N77-29323
- Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier  
[PB-266854/9] 16 p0525 N77-30255
- Ceramic coatings for components exposed to coal-gas environments: A review  
[ANL-76-124] 16 p0532 N77-31323
- Some studies on a solid state sulfur probe for coal gasification systems  
[NASA-TN-78428] 16 p0534 N77-31605
- Water requirements for steam-electric power generation and synthetic fuel plants in the western United States  
[PB-268067/7] 16 p0540 N77-31667
- Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier  
[PB-268106/2] 16 p0543 N77-32295
- In-situ coal gasification: Status of technology and environment impact  
[PB-268576/6] 16 p0548 N77-32613
- Coal gasification study  
[AD-A041860] 16 p0554 N77-33615
- Experimental program for the development of peat gasification  
[FE-2469-3] 16 p0558 N77-33650
- COAL LIQUEFACTION**
- Prospects for coal as a direct fuel and its potential through application of liquefaction and gasification technology  
13 p0008 A77-11241
- Low-sulfur coal obtained by chemical desulfurization followed by liquefaction  
13 p0008 A77-11242
- Catalytic hydrogenation of solvent-refined lignite to liquid fuels  
13 p0008 A77-11243
- Evaluation of coal liquefaction efficiency based on various ranks  
13 p0009 A77-11244
- The influence of the properties of coals on their conversion into clean fuels  
13 p0009 A77-11245
- Comparative economics for the Arthur D. Little extractive coking process --- coal liquefaction  
13 p0022 A77-12684
- A preliminary engineering assessment of jet fuel production from domestic coal and shale derived oils  
13 p0023 A77-12690
- COSTEAM: Low-rank coal liquefaction - An updated analysis  
13 p0045 A77-12934
- Startup solvent selection for the liquefaction of lignite  
13 p0059 A77-16472
- Catalytic coal liquefaction using synthesis gas  
13 p0059 A77-16473
- A laboratory evaluation of precoat filtration parameters for the solvent refined coal process  
13 p0059 A77-16474
- Mechanisms of coal particle dissolution  
13 p0059 A77-16475
- The storage of energy in future energy supply systems  
[DGLR PAPER 76-182] 13 p0059 A77-16533
- Fractionation and structural characterization of coal liquids  
13 p0069 A77-18582
- Coal liquefaction with soluble transition-metal complexes  
13 p0070 A77-18584
- Deashing of coal liquefaction products via partial deasphalting. I - Hydrogen-donor extraction effluents. II - Hydrogenation and hydroextraction effluents  
14 p0138 A77-20725
- Batch autoclave studies of catalytic hydrosulfurization of coal  
14 p0145 A77-21617
- Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids  
14 p0145 A77-21623
- Coal - The fossil energy source for the transition period  
14 p0167 A77-23392
- Characterization of synthetic liquid fuels --- analytical separation and spectroscopic techniques  
14 p0169 A77-23554
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal  
14 p0171 A77-23718
- Analysis of coal particles undergoing rapid pyrolysis --- in gasification and liquefaction processes  
14 p0175 A77-24212
- Largest ever liquefaction plant will test H-coal process  
14 p0184 A77-26289
- Evaluation of the practical aspects of the use of coal derived synthetic fuels  
[ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411
- Fluidised coal combustion - What can be done now  
14 p0191 A77-27285
- The H-Coal Process --- liquefaction  
14 p0192 A77-27289
- The SRC-II process --- fuel oil and hydrogen production by Solvent Refined Coal technique  
14 p0192 A77-27292
- A new concept for the manufacture of low sulfur fuels and chemicals from coal  
14 p0192 A77-27295
- Implications of utilizing synthetic fuels in combined cycles  
14 p0193 A77-27301
- Kinetics of heterogeneously catalyzed coal hydrol liquefaction  
14 p0196 A77-28473
- Aviation turbine fuels from shale and coal oils  
15 p0291 A77-35150
- Economic comparison of synthetic fuels - Gasification and liquefaction  
15 p0300 A77-36329
- Clean energy from Alaskan coals  
15 p0301 A77-36333

Flash hydropyrolysis process for conversion of lignite to liquid and gaseous products  
15 p0301 A77-36334

Preliminary economic analysis - Oil and power by COED-based coal conversion  
15 p0301 A77-36338

Comparative economics for the Arthur D. Little extractive coking process  
15 p0301 A77-36340

Symposium on Gasification and Liquefaction of Coal, Duesseldorf, West Germany, January 12-16, 1976, Reports  
15 p0307 A77-36806

North American views of energy choices for the future particularly fluid fuels synthesized from coal  
15 p0307 A77-36807

Fundamentals of coal liquefaction  
15 p0309 A77-36814

COGAS status report --- coal processing for clean liquid and gas fuels  
15 p0317 A77-38100

Coal particle integrity in high-temperature solvents, with and without agitation  
16 p0401 A77-41317

Charge characteristics of particles in coal derived liquids - Measurement and origin  
16 p0412 A77-42408

Liquid fuels and chemical feedstocks from coal by supercritical gas extraction  
16 p0429 A77-46449

Ignition of droplets of liquid fuels solvent extracted from coal  
16 p0508 A77-51588

Basic studies of coal pyrolysis and hydrogasification  
[PB-254878/2] 13 p0096 A77-11511

Problems and solutions in the use of coal analyses  
[FE-0390-1] 13 p0097 A77-11535

Synthesis and analysis of jet fuel from shale oil and coal syncrudes  
[NASA-CR-135112] 13 p0103 A77-12230

Fuel contaminants. Volume 1: Chemistry  
[PB-256020/9] 13 p0103 A77-12231

Some cost, energy, environmental, and resource implications of synthetic fuels produced from coal for military aircraft  
[AD-A026667] 13 p0118 A77-14271

High temperature gas turbine engine  
[FE-1765-8] 13 p0120 A77-14488

Evaluation of pollution control in fossil fuel conversion processes  
[PB-255842/7] 13 p0125 A77-14638

Second Environmental Aspects of Fuel Conversion Technology Symposium  
[PB-257182/6] 13 p0125 A77-14645

Preliminary design services coal conservation demonstration plants  
[FE-1775-3] 13 p0130 A77-15502

Hydrogen production from coal liquefaction residues  
[PB-261734/8] 15 p0350 A77-22687

Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system  
[PB-262513/5] 15 p0361 A77-24505

Projects to expand fuel sources in eastern states: Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976)  
[PB-262361/9] 15 p0374 A77-25669

Solubilization of coal in organic media  
[NASA-TM-75151] 15 p0390 A77-27498

Prevention of Failures in Coal Conversion Systems: Proceedings of the 24th Meeting of the Mechanical Failures Prevention Group  
[PB-265552/0] 15 p0395 A77-27563

Alternate aircraft fuels: Prospects and operational implications  
[NASA-TM-X-74030] 16 p0511 A77-28322

Water requirements for steam-electric power generation and synthetic fuel plants in the western United States  
[PB-268067/7] 16 p0540 A77-31667

Hydrogen production from coal liquefaction residues  
[EPRI-AF-233] 16 p0551 A77-33374

## COAL UTILIZATION

Energy and the coal industry  
13 p0005 A77-11030

Prospects for coal as a direct fuel and its potential through application of liquefaction and gasification technology  
13 p0008 A77-11241

ERDA's gas turbine development program for the next decade  
13 p0011 A77-11324

The economics of coal supply - The state of the art  
13 p0013 A77-11523

Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/  
13 p0013 A77-11524

The significance of coal in the future energy picture  
13 p0018 A77-12247

Hydrogen production by the steam-iron process  
13 p0023 A77-12688

MHD power generation - 1976 Status Report --- coal-fired design  
13 p0033 A77-12782

Investigation of direct coal-fired MHD power generation  
13 p0034 A77-12783

Liquid-metal magnetohydrodynamic system evaluation --- coal-fired designs  
13 p0034 A77-12784

Liquid-metal MHD - Cycle studies and generator experiments  
13 p0034 A77-12785

System studies of coal fired-closed cycle MHD for central station power plants  
13 p0034 A77-12786

Is nuclear energy economically viable --- competition with coal  
13 p0045 A77-12933

COSTEAM: Low-rank coal liquefaction - An updated analysis  
13 p0045 A77-12934

MHD - Energy transformation by burning coal  
13 p0045 A77-12940

Scientific-technological problems of the development of a fuel-energy complex in the USSR  
13 p0051 A77-14703

Aerosol formation during coal combustion - Condensation of sulfates and chlorides on flyash  
13 p0054 A77-15778

Atmospheric ice nuclei - No detectable effects from a coal-fired powerplant plume  
13 p0054 A77-15780

Slag interaction phenomena on MHD generator electrodes  
[AIAA PAPER 77-109] 14 p0135 A77-19833

Flue gas desulfurization experience  
14 p0136 A77-20381

In-channel observations on coal slag --- in MHD generators  
14 p0139 A77-21222

Replenishment processes and flow train interaction --- in MHD generators  
14 p0139 A77-21223

Slag layers in direct coal-fired MHD power generation  
14 p0139 A77-21224

Test results on the spinel electrode module in laboratory and simulated MHD environment  
14 p0140 A77-21227

Crystallization and vaporization studies on synthetic coal slag compositions  
14 p0140 A77-21228

Thermionic emission characteristics of seeded coal slags  
14 p0140 A77-21229

Utilization of Western coal for MHD energy conversion  
14 p0140 A77-21230

Influence of coal type and drying upon MHD power plants and components  
14 p0140 A77-21231

Development of a baseline reference design for an open cycle MHD power plant for commercial service  
14 p0140 A77-21232

Experimental investigation on a direct coal-fired MHD generator  
14 p0141 A77-21238



- Recent experimental studies of the interaction of potassium seed with coal slag in a direct-coal fired MHD generator 14 p0141 A77-21250
- System studies of coal fired-closed cycle MHD for central station power plants 14 p0142 A77-21267
- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269
- Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile --- for coal-fired gas turbines 14 p0145 A77-21698
- Is commercial coal conversion practical 14 p0146 A77-21761
- Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096
- Can new resources fill the energy gap 14 p0166 A77-23380
- Coal - The fossil energy source for the transition period 14 p0167 A77-23392
- Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors 14 p0175 A77-24210
- Gasification of Rhenish brown coal as mined 14 p0175 A77-24213
- Environmental considerations of converting fossil-fueled power plants from oil or natural gas to coal 14 p0181 A77-26043
- Chemical cleaning of coal [ASME PAPER 76-WA/APC-2] 14 p0184 A77-26409
- Evaluation of the practical aspects of the use of coal derived synthetic fuels [ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411
- Coal-in-oil - A substitute boiler fuel [ASME PAPER 76-WA/FU-2] 14 p0185 A77-26453
- Combustion of pulverized, solvent-refined coal [ASME PAPER 76-WA/FU-6] 14 p0185 A77-26456
- Recent tests of industrial gas turbine combustors fueled with simulated low heating value coal gas [ASME PAPER 76-WA/GT-3] 14 p0185 A77-26459
- POUSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544
- Applicability of the Meyers Process for desulfurization of U.S. coal /A survey of 35 coal mines/ 14 p0191 A77-27278
- Comparison of coal conversion processes for electric power generation 14 p0192 A77-27288
- Fluidized bed combustion 14 p0192 A77-27290
- An overview of the U.S. energy dilemma 14 p0192 A77-27294
- World coal resources and the role of coal in turn-of-the-century energy economy 14 p0198 A77-28758
- Analysis of electrical power generation costs 15 p0257 A77-30600
- Alternative energy sources --- Book 15 p0261 A77-31467
- Energy policies of France, Britain, and Germany compared 15 p0263 A77-31572
- Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process 15 p0267 A77-32247
- Energy in competition --- coal and nuclear energy 15 p0271 A77-32799
- The impact of the new energy technologies 15 p0272 A77-33124
- Hydrogen production from coal using a nuclear heat source 15 p0275 A77-33339
- Nonisothermal hydrogen-induced desulfurization of coal 15 p0287 A77-33544
- Materials utilization in a direct coal-fired MHD generator system 15 p0292 A77-35151
- State of the art of particulate and SO<sub>2</sub> removal on coal fired boilers 15 p0293 A77-35167
- Synthetic additives for SO<sub>2</sub> removal from combustion gas in a fluidized-bed coal combustor 15 p0293 A77-35168
- Particulate sampling at high temperature and high pressure --- of coal conversion processes 15 p0293 A77-35172
- Comparative discussion on measurements of atmospheric natural radioactivity and pollution by coal smoke particles 15 p0294 A77-35349
- The outlook for more efficient fuel utilization in generation of process heat 15 p0294 A77-35400
- Determination of SO<sub>2</sub> concentrations from a coal-burning power plant stack by Fourier spectrometry 15 p0296 A77-36024
- Economic evaluation by ERDA of alternative fossil energy technologies 15 p0300 A77-36328
- The relative advantages of coal conversion routes for electric power generation --- economics of large scale installations 15 p0300 A77-36330
- A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen 15 p0302 A77-36343
- Present status of fluidised-bed combustion 15 p0303 A77-36422
- Coal gasification update 15 p0306 A77-36763
- Factors influencing the economics of large-scale in situ coal gasification operations 15 p0306 A77-36765
- Research needs report: Energy conversion research --- Book 15 p0313 A77-37646
- Stack gas cleanup --- scrubber systems for high-sulfur coal 15 p0317 A77-37939
- Future trends in electrical energy generation economics in the United States 15 p0317 A77-37960
- An integrated process model of the Fischer-Tropsch process for liquid fuels production from coal 15 p0318 A77-38213
- Plasma luminosity fluctuations as a diagnostic tool --- for coal-fired MHD facility 15 p0328 A77-39547
- Electrical behavior of slag coatings in coal-fired MHD generators 15 p0328 A77-39551
- Electrical conductivity of molten coal slags containing potassium seed 15 p0330 A77-39565
- Devolatilization of pulverized coal during rapid heating --- in exhaust gases of combustion driven MHD generators 15 p0331 A77-39566
- Ignition and combustion behavior of pulverized coal jets in hot oxidizing atmospheres --- for MHD systems 15 p0331 A77-39568
- Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system 15 p0331 A77-39570
- Coal fired non-equilibrium closed cycle MHD power plant system since ECAS --- Energy Conversion Alternatives Study 15 p0332 A77-39576
- Open-cycle coal burning MHD power plants for commercial service 15 p0333 A77-39578
- Fuel conversion strategy impacts on compliance with photochemical oxidant standards 15 p0333 A77-39585
- Economic problems concerning the combustion of raw lignite 15 p0333 A77-39650

- Further studies on the oxidation of sulfur dioxide in coal-fired power plant plumes 15 p0333 A77-39657
- Options for the conversion of fossil fuels 15 p0335 A77-39835
- Investigation into the use of large-scale total-energy systems in mild and warm climates 16 p0401 A77-41318
- Multi-stage activation of brown-coal chars with oxygen 16 p0401 A77-41319
- A pressurized fluidized bed coal fired combined cycle electric power generation [AIAA PAPER 77-1013] 16 p0412 A77-42482
- Desulfurization of coal by use of chemical comminution 16 p0418 A77-43009
- Energy supply of the Federal Republic of Germany 16 p0419 A77-43566
- Acid mine drainage - The problem and the solution 16 p0425 A77-45125
- Liquid fuels and chemical feedstocks from coal by supercritical gas extraction 16 p0429 A77-46449
- Conceptual design of closed Brayton cycle for coal-fired power generation 16 p0445 A77-48714
- Environmental considerations in advanced energy conversion technology assessments 16 p0452 A77-48777
- Environmental assessment of advanced energy conversion technologies 16 p0452 A77-48778
- A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants 16 p0452 A77-48779
- An environmental assessment of liquid metal topping cycles --- in coal-fired fluidized bed processors for electric power generation 16 p0452 A77-48780
- Pressurized fluidized bed pilot plant for production of electric power using high sulfur coal 16 p0453 A77-48782
- Coal fired combined cycle for electric power generation 16 p0453 A77-48783
- A unitized 500-megawatt fluidized bed boiler design 16 p0453 A77-48786
- Analysis of power cycles with centrifugal fluidized bed coal combustion 16 p0453 A77-48787
- Development of the fluidized-bed carbon-burnup cell 16 p0454 A77-48789
- A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute 16 p0458 A77-48823
- Progress in channel development for direct coal fired MHD 16 p0458 A77-48824
- Assuring the performance of fossil energy programs 16 p0503 A77-50499
- Eliminate source emission codes for coal-refuse fired power plants 16 p0504 A77-51128
- Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station 16 p0504 A77-51135
- Flue gas desulfurization by fly ash 16 p0504 A77-51146
- Electrostatic precipitator design for western coals 16 p0504 A77-51148
- Air pollution control for industrial coal-fired boilers 16 p0504 A77-51152
- Development of new technologies for energy production in the Federal Republic of Germany 16 p0505 A77-51157
- Water and energy systems - A planning model 16 p0506 A77-51279
- Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite 16 p0508 A77-51587
- A 1977 approach to sulfur oxide emissions [ASME PAPER 77-JPGC-PWR-1] 16 p0508 A77-51621
- A summary of the ECAS MHD power plant results [NASA-TM-X-73491] 13 p0086 N77-10642
- Underground coal mining: An assessment of technology 13 p0093 N77-10974
- Implementing coal utilization provisions of Energy Supply and Environmental Coordination Act [PB-255855/9] 13 p0109 N77-12549
- Participating surveillance services for electric power program. Coal conversion and utilization: Direct combustion of coal-90e, advanced power-90f. Summary for ERDA annual report, CY 1975 [PB-1236-4] 13 p0130 N77-15507
- Investigating storage, handling, and combustion characteristics of solvent refined coal [PB-257557/9] 14 p0212 N77-17595
- Balanced program plan. Volume 4: Coal conversion [ORNL-5123-YOL-4] 14 p0216 N77-18566
- Development of nondestructive evaluation methods for coal-conversion systems [CONF-760472-2] 14 p0216 N77-18567
- Coal technology program [ORNL-5159] 14 p0216 N77-18568
- A western regional energy development study: Economics. Volume 1: SRI energy model results [PB-260835/4] 14 p0251 N77-21706
- Economic feasibility: Fuel grade methanol from coal [TID-27156] 15 p0345 N77-22630
- Environmental research needs for coal conversion and combustion technologies [PB-262159/7] 15 p0347 N77-22659
- Technology and use of low-rank coals in the USA [CONF-760495-1] 15 p0392 N77-27519
- Coal conversion: Description of technologies and necessary biomedical and environmental research [ORNL-5192] 15 p0392 N77-27520
- Coal conversion program. Energy Supply and Environmental Coordination Act (as amended). Section 2 [PB-265815/1] 15 p0393 N77-27542
- MHD combustor design study --- coal-fired systems [TID-27144] 15 p0396 N77-27923
- The environmental effects of using coal for generating electricity [PB-267237/6] 16 p0524 N77-29655
- Evaluation of phase 2 conceptual designs and implementation assessment resulting from the Energy Conversion Alternatives Study (ECAS) --- coal utilization in electric power generation [NASA-TM-73515] 16 p0527 N77-30598
- Energy technologies for the West: The Fossil Option [TID-27430] 16 p0537 N77-31644
- COASTAL ECOLOGY**
- Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449
- The ecology of a marine littoral receiving effluents from a petroleum refinery 16 p0433 A77-47173
- A process for coastal resource management and impact assessment [PB-264811/1] 15 p0376 N77-26004
- COASTAL WATER**
- Predicting changes in tidal regime - The open boundary problem --- for tidepower generation 14 p0199 A77-29076
- Use of Landsat data for the detection of marine oil slicks --- for oil exploration and pollution control 15 p0267 A77-32244
- COATING**
- Method for fabricating solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 15 p0363 N77-24593
- COATINGS**
- Survey of selective absorber coatings for solar energy technology 14 p0199 A77-29067
- Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638
- A performance evaluation of various coatings, substrate materials, and solar collector systems [NASA-TM-X-73355] 13 p0128 N77-15489
- Cadmium stannate selective optical films for solar energy applications [PB-261850/2] 15 p0348 N77-22672

- Thermal barrier coating on high temperature industrial gas turbine engines [NASA-CR-135147] 15 p0390 N77-27496
- Processing on high efficiency solar collector coatings 16 p0526 N77-30286
- CODING**
- GDIST: A computer code for analysis of statistical distributions of physical data [PB-266762/4] 16 p0533 N77-31589
- COKE**
- Comparative economics for the Arthur D. Little extractive coking process --- coal liquefaction 13 p0022 A77-12684
- Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096
- Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium 14 p0198 A77-28776
- Comparative economics for the Arthur D. Little extractive coking process 15 p0301 A77-36340
- COLD WEATHER**
- A compound parabolic concentrator array optimized for northern climates --- cold weather effects on solar collectors 16 p0474 A77-48958
- Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project [ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- COLLISION RATES**
- Ionization instability in non-equilibrium MHD generators 16 p0416 A77-42894
- COLORADO**
- An engineering feasibility study of using low temperature geothermal sources in Colorado 13 p0031 A77-12762
- United States special format report: Report of the Phoenix Corporation, City of Colorado Springs Solar Heating Project [SE-4578-76/1] 15 p0373 N77-25647
- COMBAT**
- Report of the Army Scientific Advisory Panel Ad Hoc Group on fire-safe fuels [AD-A023763] 13 p0095 N77-11208
- COMBUSTIBLE FLOW**
- Thermal explosion of moving reacting fluids of variable viscosity 13 p0052 A77-14980
- Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation 15 p0288 A77-33838
- Ignition and combustion behavior of pulverized coal jets in hot oxidizing atmospheres --- for MHD systems 15 p0331 A77-39568
- Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821
- COMBUSTION**
- Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power [ERDA-76-69] 13 p0130 N77-15506
- Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames [PB-259911/6] 14 p0234 N77-20639
- Design study of superconducting magnets for a combustion magnetohydrodynamic (MHD) generator [NASA-CR-135178] 14 p0234 N77-20886
- Environmental research needs for coal conversion and combustion technologies [PB-262159/7] 15 p0347 N77-22659
- COMBUSTION CHAMBERS**
- Some results of an investigation with the U-25 experimental-industrial facility, aimed at raising its parameters to the design level --- MHD generator energy converter 14 p0136 A77-20105
- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269
- Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile --- for coal-fired gas turbines 14 p0145 A77-21698
- Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors [ASME PAPER 76-WA/PU-10] 14 p0185 A77-26457
- Fluidisation and gas combustion in a rotating fluidised bed 15 p0264 A77-31674
- Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply 15 p0272 A77-33170
- Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation 15 p0288 A77-33838
- Testing the annular combustor of the NK-8 aero-engine on natural gas --- for stationary gas turbine installation 16 p0426 A77-45325
- Direct-connect tests of hydrogen-fueled supersonic combustors 16 p0440 A77-48240
- Fluidized bed adiabatic combustor power plants - Concepts and comparisons 16 p0453 A77-48784
- Analysis of power cycles with centrifugal fluidized bed coal combustion 16 p0453 A77-48787
- Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- Heavy-fuel flame radiation in gas turbine combustors - Exploratory results 16 p0508 A77-51589
- Reduction of gaseous pollutant emissions from gas turbine combustors using hydrogen-enriched jet fuel [NASA-CR-149146] 13 p0094 N77-11198
- Effect of ceramic coating of JT8D combustor liner on maximum liner temperatures and other combustor performance parameters [NASA-TN-X-73581] 13 p0126 N77-15037
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 14 p0245 N77-21645
- CDIF combustor design [TID-27143] 15 p0377 N77-26393
- TRW 25 MW/sub T/staged MHD coal combustor conceptual design study [TID-27145] 15 p0396 N77-27922
- MHD combustor design study --- coal-fired systems [TID-27144] 15 p0396 N77-27923
- Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier [PB-268106/2] 16 p0543 N77-32295
- COMBUSTION CONTROL**
- Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification [SAE PAPER 770047] 16 p0424 A77-44557
- Kinetics of gasification in a combustion pot - A comparison of theory and experiment 16 p0440 A77-48176
- Dynamic modeling of fluidized bed boilers for control system design 16 p0454 A77-48792
- Hydrogen combustion. Part 1: Investigation of hydrogen flame control methods [CTI-IV-75-01449] 14 p0235 N77-21204
- COMBUSTION EFFICIENCY**
- Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile --- for coal-fired gas turbines 14 p0145 A77-21698
- Reduction of atmospheric pollution due to the automobile and energy savings 14 p0162 A77-22948
- Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels 14 p0177 A77-24852

- Fiat petrol engine performance with a mixture of  
basil extract with petrol 14 p0179 A77-25196
- Coal-in-oil - A substitute boiler fuel  
[ASME PAPER 76-WA/FU-2] 14 p0185 A77-26453
- Methods of on-board generation of hydrogen for  
vehicular use 15 p0280 A77-33383
- The interaction of automotive-engine efficiency  
and exhaust pollution 15 p0296 A77-35922
- Economic problems concerning the combustion of raw  
lignite 15 p0333 A77-39650
- Combustion technology for the improvement of  
engine efficiency and emission characteristics  
16 p0440 A77-48172
- Pressurized fluidized-bed coal combustion  
16 p0454 A77-48788
- Development of the fluidized-bed carbon-burnup cell  
16 p0454 A77-48789
- Fluidized-bed combustion of anthracite refuse  
16 p0454 A77-48793
- Emissions and performance of catalysts for gas  
turbine catalytic combustors  
[NASA-TN-X-73543] 13 p0104 N77-12406
- Participating surveillance services for electric  
power program. Coal conversion and utilization:  
Direct combustion of coal-90e, advanced  
power-90f. Summary for ERDA annual report, CY  
1975 13 p0130 N77-15507
- Combustion rates and mechanisms of pulverized  
coals and coal-derived fuels  
[SAND-76-8229] 14 p0224 N77-19638
- Methods of on-board generation of hydrogen for  
vehicular use 14 p0242 N77-21617
- High efficiency engine cycles for air transport  
fuel economy 15 p0339 N77-22126
- COMBUSTION PHYSICS**
- Combustion of pulverized, solvent-refined coal  
[ASME PAPER 76-WA/FU-6] 14 p0185 A77-26456
- Tertiary oil production process 14 p0196 A77-28520
- An examination of the stirred reactor as a tool  
for the determination of rate constants of the  
H<sub>2</sub>-O<sub>2</sub> combustion reactions 15 p0283 A77-33406
- Present status of fluidised-bed combustion  
15 p0303 A77-36422
- Symposium on Combustion /International/, 16th,  
Massachusetts Institute of Technology,  
Cambridge, Mass., August 15-20, 1976, Proceedings  
16 p0439 A77-48158
- Synthetic fuels and combustion 16 p0439 A77-48159
- COMBUSTION PRODUCTS**
- Study of the ionization of the additive in MHD  
installations 13 p0002 A77-10424
- Sulphur pollution and emission charges 13 p0005 A77-11033
- Influence of heavy fuel oil composition and boiler  
combustion conditions on particulate emissions  
13 p0008 A77-11162
- Controlled tipping of combustion residues  
13 p0008 A77-11175
- Compilation of an inventory for particulate  
emissions in Belgium 13 p0009 A77-11271
- Clean air protection and industrial development  
13 p0010 A77-11303
- Aerosol formation during coal combustion -  
Condensation of sulfates and chlorides on flyash  
13 p0054 A77-15778
- Atmospheric ice nuclei - No detectable effects  
from a coal-fired powerplant plume 13 p0054 A77-15780
- Production of atmospheric nitrous oxide by  
combustion 13 p0061 A77-16922
- Measurement of the excess oxidant ratio in the  
combustion products of an MHD-generator  
14 p0136 A77-20107
- Joint US-USSR experimental studies of the  
dependence of plasma electrical conductivity on  
plasma temperature performed in the Avco Mark VI  
MHD facility 14 p0142 A77-21257
- The minimum combustion gas recirculation ratio for  
fuel gas conversion in a MHD cycle 14 p0157 A77-22552
- Fluidized bed combustion 14 p0192 A77-27290
- Thermodynamic analysis of the formation of the  
oxides of nitrogen and sulfur in fuel combustion  
products 15 p0269 A77-32506
- Whatever happened to the Wankel engine  
15 p0272 A77-33125
- Formation of sulfuric anhydride and nitrogen  
oxides in boilers at variable operating modes  
15 p0272 A77-33174
- Conductivity of seeded combustion products of  
acetylene systems 15 p0288 A77-34039
- Synthetic additives for SO<sub>2</sub> removal from  
combustion gas in a fluidized-bed coal combustor  
15 p0293 A77-35168
- Particulate sampling at high temperature and high  
pressure --- of coal conversion processes  
15 p0293 A77-35172
- Soot and gaseous pollutant formation in a burning  
fuel spray in relation to pressure and air/fuel  
ratio 15 p0293 A77-35186
- The oxidant formation potential of emissions from  
catalyst-equipped vehicles 15 p0333 A77-39596
- Hydrogen peroxide emission levels from a hydrogen  
fueled combustion engine 16 p0399 A77-40644
- Catalytic action of combustion-product deposits in  
the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the  
combustion chambers and exhaust channels of  
thermoelectric plants 16 p0420 A77-44179
- Northeastern utilities are meeting the clean air  
challenge 16 p0424 A77-44612
- NO<sub>x</sub> from fuel nitrogen in two-stage combustion  
16 p0439 A77-48169
- Power generation: Air pollution monitoring and  
control --- Book 16 p0504 A77-51126
- Flue gas desulfurization by fly ash 16 p0504 A77-51146
- A 1977 approach to sulfur oxide emissions  
[ASME PAPER 77-JPGC-PWR-1] 16 p0508 A77-51621
- Fuels and fuel additives for highway vehicles and  
their combustion products. Guide to evaluation  
of their potential effects on health  
[PB-254088/8] 13 p0084 N77-10222
- The formation of nitrogen oxides from fuel nitrogen  
[PB-252462/7] 13 p0092 N77-10717
- Proceedings of the Stationary Source Combustion  
Symposium. Volume 1. Fundamental research  
[PB-256320/3] 13 p0116 N77-13569
- Proceedings of the Stationary Source Combustion  
Symposium. Volume 2. Fuels and process  
research and development 13 p0116 N77-13570
- Proceedings of the Stationary Source Combustion  
Symposium. Volume 3: Field Testing and Surveys  
[PB-257146/1] 13 p0125 N77-14643
- Combustion rates and mechanisms of pulverized  
coals and coal-derived fuels  
[SAND-76-8229] 14 p0224 N77-19638
- Contamination of groundwater by heavy metals from  
the land disposal of fly ash  
[COO-2727-4] 15 p0357 N77-23631
- Assessment application for direct coal combustion  
[PB-263651/2] 15 p0359 N77-24318
- PCB emissions from stationary sources: A  
theoretical study  
[PB-262850/1] 15 p0367 N77-24665
- COMBUSTION STABILITY**
- An examination of the stirred reactor as a tool  
for the determination of rate constants of the  
H<sub>2</sub>-O<sub>2</sub> combustion reactions 14 p0245 N77-21644

## COMBUSTION TEMPERATURE

Boundary layer measurements of temperature and electron number density profiles in a combustion MHD generator

15 p0288 A77-33710

## COMMERCE

Weekly petroleum statistics reports, 1974-1975 [PB-255920/1]

13 p0124 A77-14608

Energy management guide for light industry and commerce. EPIC energy management series [PB-263121/6]

15 p0356 A77-23616

Quarterly report to US House and Senate Committees on Appropriations (3rd) [PB-265490/3]

16 p0517 A77-28616

## COMMERCIAL AIRCRAFT

Liquid hydrogen as propellant for commercial aircraft

13 p0059 A77-16534

[DGLR PAPER 76-188] The pay-off for advanced technology in commercial aircraft design and operation

13 p0071 A77-19012

Air transport propulsion for the 1980's

14 p0138 A77-20717

Fuel subsystem characteristics for LH2 aircraft

15 p0281 A77-33393

The competitive market for commercial VSTOL [AIAA 77-573]

15 p0290 A77-34933

Cost/benefit assessment of the application of composite materials to subsonic commercial transport engines [NASA-TM-X-73557]

13 p0111 A77-13064

Future aircraft requirements: A notebook of airline thoughts

13 p0117 A77-13976

Air transport propulsion for the 1980's

13 p0117 A77-13980

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137926]

13 p0126 A77-15007

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137927]

13 p0126 A77-15008

Variable cycle engine applications and constraints --- for commercial and military (fighter) aircraft

15 p0339 A77-22125

Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis [NASA-CR-137923]

15 p0353 A77-23072

Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses [NASA-CR-137924]

15 p0353 A77-23073

Innovative Aircraft Design Study (IADS) task 2, volume 1 [AD-A041234]

16 p0531 A77-31141

## COMMERCIAL ENERGY

Space heating systems new and conventional in the Northwest with emphasis on alternate energy adaptations

13 p0028 A77-12736

Geothermal energy in Hawaii - Hydrothermal systems

13 p0029 A77-12741

Electric utility companies and geothermal power

13 p0031 A77-12759

Combined solar and petroleum energy HVAC system for a commercial building in Dhabran --- Heating, Ventilating and Air Conditioning

13 p0078 A77-19111

Water pumping - A practical application of solar energy

13 p0079 A77-19117

ECAS MHD system studies --- Energy Conversion Alternatives Study

14 p0142 A77-21268

The use of commercially available absorption units on solar-powered cooling systems

14 p0168 A77-23445

Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps [ASME PAPER 76-WA/SOL-23]

14 p0190 A77-26528

SO2 control technologies - Commercial availabilities and economics

14 p0191 A77-27279

The SRC-II process --- fuel oil and hydrogen production by Solvent Refined Coal technique

14 p0192 A77-27292

Considerations on coal gasification

15 p0266 A77-32169

Technical prospects for commercial and residential distribution and utilization of hydrogen

15 p0283 A77-33404

A comparison of residential and commercial energy use in the United States and Sweden

15 p0297 A77-36114

Historical patterns of residential and commercial energy uses

15 p0298 A77-36244

Thermal storage - A sleeping giant

15 p0304 A77-36427

An assessment of energy storage systems suitable for use by electric utilities

15 p0310 A77-36982

Energy management for commercial buildings and cooling storage [AIAA 77-1004]

16 p0402 A77-41552

Energy conservation by symbiosis

16 p0408 A77-41852

Lessons learned from Atlanta /towns/ solar experiment --- solar heating and cooling for school

16 p0423 A77-44491

Energy demand studies: Major consuming countries. Analyses of 1972 demand and projections of 1985 demand --- Book

16 p0428 A77-46094

BI-gas pilot plant processes 5 tph --- bituminous coal gasification

16 p0441 A77-48478

Practicability study of Stirling total energy systems

16 p0465 A77-48882

Commercial applications of solar total energy systems

16 p0468 A77-48904

Solar process heat from concentrating flat-plate collectors

16 p0474 A77-48957

Heating of buildings with solar energy

16 p0474 A77-48959

Solar heating and cooling in a commercial building

16 p0477 A77-48983

A solar/Stirling total energy system

16 p0481 A77-49021

The design of a solar cooling and heating system for a commercial building

16 p0497 A77-49148

National Emissions Data Systems (NEDS) fuel use report, 1973 [PB-253908/8]

13 p0083 A77-10220

National benefits associated with commercial application of fuel cell powerplants [ERDA-76-54]

13 p0123 A77-14597

Commercial application of laser fusion [LA-76-1459]

14 p0227 A77-19872

General Electric Company proposed management plan, commercial buildings, National Solar Demonstration Program [COO-2683-76-3]

14 p0229 A77-20568

General Electric Company proposed demonstration Projects Matrix, commercial buildings, National Solar Demonstration Program [COO-2683-76-5]

14 p0230 A77-20569

Proposed management plan, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-8]

14 p0230 A77-20570

Proposed test and evaluation plan, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-9]

14 p0230 A77-20571

Proposed demonstration Projects Matrix, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-10]

14 p0230 A77-20572

Solar energy in buildings: Implications for California energy policy [NASA-CR-152686]

15 p0343 A77-22613

National program for solar heating and cooling of buildings: Project data summaries. Volume 1: Commercial and residential demonstration [ERDA-76-127]

15 p0346 A77-22639

Interim performance criteria for solar heating and cooling systems in commercial buildings [PB-262114/2]

15 p0348 A77-22669

Study of future paratransit requirements [PB-264082/9]

15 p0376 A77-26028

# CONTINUATION

# SUBJECT INDEX

Energy management in residential and small commercial buildings [BNL-50576] 15 p0392 N77-27511

**COMMUNICATION**  
Desulfurization of coal by use of chemical communication 16 p0418 A77-43009

**COMMODITIES**  
A summary of the DABPA energy and materials shortages programs, fiscal years 1972-1976 [AD-A036021] 15 p0375 N77-25677

**COMMUNICATION SATELLITES**  
Power source requirements of electric propulsion systems used for north-south stationkeeping of communication satellites 13 p0040 A77-12833

The nuclear spinner for Satcom applications --- comparing nuclear and solar power supplies 13 p0041 A77-12838

UK, T5 ion engine thrust vector control considerations [AIAA PAPER 76-1064] 13 p0045 A77-13030

Status of development and application of gas-stabilized heat-pipe radiators [DGLR PAPER 76-192] 13 p0060 A77-16557

Space: A resource for earth - An AIAA review --- Book 15 p0269 A77-32440

New themes for space: Mankind's future needs and aspirations; Proceedings of the Bicentennial Space Symposium, Washington, D.C., October 6-8, 1976 16 p0430 A77-46627

Past experience - Basis for future advanced power systems for communications satellites [IAF PAPER 77-22] 16 p0506 A77-51390

On the active and passive CETI from earth satellite orbit --- communication with extraterrestrial intelligence [IAF PAPER A-77-48] 16 p0507 A77-51524

Space solar power versus space communications [IAF PAPER A-77-65] 16 p0507 A77-51532

**COMMUNICATIONS TECHNOLOGY SATELLITE**  
Preliminary report on the CTS transient event counter performance through the 1976 spring eclipse season [NASA-TM-X-73487] 13 p0083 N77-10116

Test program for transmitter experiment package and heat pipe system for the communications technology satellite [NASA-TM-X-3455] 13 p0095 N77-11268

Transmitter experiment package for the communications technology satellite [NASA-CR-135035] 15 p0360 N77-24332

**COMMUNITIES**  
Feasibility of heating domestic hot water for apartments with solar energy [AD-A028418] 14 p0209 N77-16461

Economic study of solar total energy [SAND-76-5291] 14 p0216 N77-18574

Summary description of the BOOM1 model --- simulating power plant impact on isolated communities [LA-6424-HS] 15 p0369 N77-25010

Weather, climate and human settlements [WHO-448] 15 p0387 N77-27038

Santa Clara, California, community center, commercial solar demonstration legal alternatives, implications, and financing of solar heating and cooling by a municipal corporation [SAN/1063-76/1] 15 p0394 N77-27549

**COMPARISON**  
A parametric utility comparison of coal and nuclear electricity generation [PB-266064/5] 16 p0523 N77-29634

**COMPATIBILITY**  
Heat pipe materials compatibility [NASA-CR-135069] 13 p0103 N77-12182

**COMPLEX SYSTEMS**  
Principles and application of systems in engineering as rational aid for economy, state, and research; Meeting, Bonn, West Germany, November 9, 10, 1976, Communications 14 p0191 A77-27032

Idealization of complex dynamic systems with examples involving electrical energy systems --- Russian book 16 p0434 A77-47331

**COMPOSITE MATERIALS**  
Software aspects of super composites --- composition selection to meet user requirements 13 p0053 A77-15301

Survey of selective absorber coatings for solar energy technology 14 p0199 A77-29067

Composite technology - The boom is under way --- rotorcraft materials 15 p0287 A77-33616

The use of composite flywheels for braking energy recovery in road transport vehicles 16 p0401 A77-41351

Energy storage - An interference assembled multiring superflywheel 16 p0450 A77-48761

Cost/benefit assessment of the application of composite materials to subsonic commercial transport engines [NASA-TM-X-73557] 13 p0111 N77-13064

A study of the failure of joints in composite material fuel cells due to hydraulic ram loading [AD-A027258] 13 p0117 N77-14016

Composite material structures for thermophotovoltaic conversion radiator [AD-A026859] 13 p0132 N77-15519

Design development of advanced composite flywheels [AD-A030712] 14 p0214 N77-18230

Composite fiber flywheel for energy storage [UCL-78085] 14 p0225 N77-19645

Fiber composite program for flywheel applications [UCL-50033-76-1] 15 p0345 N77-22633

**COMPOSITE STRUCTURES**  
High-speed flywheels as possible energy storage devices in the future 13 p0056 A77-15856

Advanced low-mass solar array technology [AIAA PAPER 77-488] 14 p0173 A77-23908

Optimization of composite flywheel design 15 p0260 A77-31044

Fabrication and assembly of large composite structures in space [AIAA PAPER 77-543] 15 p0266 A77-32065

Composite fiber flywheel for energy storage 15 p0306 A77-36672

Self-regulating composite bearingless wind turbine 16 p0491 A77-49095

**COMPOSITION (PROPERTY)**  
Heating oils, 1976 [BERC/PPS-76/4] 15 p0344 N77-22626

**COMPRESSED AIR**  
Compressed air energy storage - A near term option for utility application 13 p0027 A77-12727

Compressed air energy storage [AIAA 77-1008] 16 p0403 A77-41555

Conceptual design of underground compressed air storage electric power systems 16 p0451 A77-48770

Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825

Compressed air storage for load leveling of nuclear power plants 16 p0459 A77-48826

An assessment of mechanical energy storage for solar systems 16 p0460 A77-48839

Economic and technical feasibility study of compressed air storage [COG-2559-1] 13 p0122 N77-14593

Technical and economic feasibility analysis of the no-fuel compressed air energy storage concept [BNWL-2065] 14 p0225 N77-19643

Preliminary feasibility evaluation of compressed air storage power systems, volume 1 [CONS/NSF/42-1] 16 p0556 N77-33636

**COMPRESSED GAS**  
Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 15 p0284 A77-33409

**COMPRESSIBILITY EFFECTS**  
Hydrogen as a fuel in compression ignition engines 13 p0071 A77-18932

Energy storage, compression, and switching --- Book 15 p0299 A77-36284

- COMPRESSIBLE BOUNDARY LAYER**  
Boundary-layer separation from the electrode wall  
of an MHD generator 13 p0048 A77-13711
- COMPRESSION TESTS**  
Minor radius compression experiments --- for ohmic  
heating efficiency improvement in Tokamaks 16 p0407 A77-41683
- COMPRESSIVE STRENGTH**  
Reinforced pillow solar water heater 16 p0493 A77-49114
- COMPRESSOR EFFICIENCY**  
10 design principles for air-to-air heat pumps 16 p0408 A77-41824  
Investigating the starting modes of the GT-35 gas  
turbine plant --- turbocompressor tests 16 p0426 A77-45324
- COMPRESSORS**  
A hydride compressor 13 p0046 A77-13336  
Emissions from compressor stations --- noise  
pollution 15 p0287 A77-33545  
Procedure for calculating thermocompressor  
thermodynamical parameters --- for solar energy  
conversion 16 p0442 A77-48519
- COMPUTATION**  
Comparison of calculated and measured maximum  
aboveground air pollutant concentrations and  
their respective distances from the source of  
release of large power plants [ORNL-TR-4231] 15 p0386 A77-26712
- COMPUTER GRAPHICS**  
Computer graphics demonstration: Area coal  
availability studies [PB-267923/1] 16 p0541 A77-31824
- COMPUTER PROGRAMMING**  
Development of signal processing algorithms for  
ultrasonic detection of coal seam interfaces  
[NASA-CR-150024] 13 p0085 A77-10610  
Design and modeling of solar sea power plants by  
geometric programming [COO-2895-T1] 14 p0231 A77-20585  
Overview of MINPACK [CONF-760842-19] 15 p0396 A77-27761
- COMPUTER PROGRAMS**  
Software aspects of super composites ---  
composition selection to meet user requirements 13 p0053 A77-15301  
Computational program for accurate  
predetermination of irradiance and illuminance  
in connection with solar energy utilization 14 p0147 A77-21777  
Balance and optimization procedure for  
thermochemical cycles for hydrogen production 15 p0276 A77-33345  
OPTIMO - A method for process evaluation applied  
to the thermochemical decomposition of water 15 p0320 A77-38526  
Use of calculated displaced shapes to define the  
reflected light pattern from a focused collector 16 p0473 A77-48948  
Solar system market capture in the  
climato-economic regions of the United States 16 p0493 A77-49116  
Solar heating and cooling computer analysis - A  
simplified sizing design method for non-thermal  
specialists 16 p0497 A77-49157  
Planning models for the assessment of advanced  
energy storage systems 13 p0105 A77-12504  
A design procedure for solar heating systems 13 p0128 A77-15485  
Cooperative study of heavy duty diesel emission  
measurement methods [PB-257137/0] 13 p0133 A77-15541  
InterTechnology Corporation proposed systems level  
plan for solar heating and cooling, commercial  
buildings. Volume 2: National solar  
demonstration program [COO-2688-76-6-VOL-2] 14 p0224 A77-19633  
Engineering-economic model of residential energy use  
[ORNL-TR-5470] 14 p0231 A77-20580  
A computer program to calculate and plot  
wind-generated stored energy at constant  
consumption [AD-A029977] 15 p0356 A77-23613
- Economy-wide impacts of interfuel substitution:  
Substitution of electricity for imported oil  
[BNL-50538] 15 p0369 A77-24998  
Project Independence Evaluation System (PIES)  
documentation. Volume 1: The integrating model  
of the Project Independence Evaluation System  
[PB-263020/0] 15 p0374 A77-25661  
University of Utah direct contact Geothermal Power  
Project report. A computer program for  
determining the thermodynamic properties of water  
[UTEC-82-76-171] 15 p0380 A77-26642  
Optimization technique for geothermal power plants  
using a binary fluid cycle [BNWL-2155] 15 p0394 A77-27546  
Land use, energy flow and policy making in  
society. SIMPAC handbook. A guide to the  
modeling of socio-economic phenomena  
[PB-267134/5] 16 p0530 A77-30637  
GDIST: A computer code for analysis of  
statistical distributions of physical data  
[PB-266762/4] 16 p0533 A77-31589  
Comparison of computer-predicted and observed  
energy uses in a multi-family high-rise  
apartment building [PB-267829/0] 16 p0539 A77-31665  
ENFORM: An energy information system  
[BNWL-2195] 16 p0542 A77-32016  
Dimensions, volume 61, no. 5 [PB-267321/8] 16 p0542 A77-32027
- COMPUTER TECHNIQUES**  
High-efficiency thin silicon solar cells 14 p0148 A77-21786  
Analysis of steranes and triterpanes in geolipid  
extracts by automatic classification of mass  
spectra 15 p0260 A77-31262  
Thermochemical production of hydrogen - Myth or  
reality 15 p0270 A77-32593  
Definition and analysis of thermochemical  
processes for hydrogen production based on  
iron-chlorine reactions 15 p0276 A77-33351  
Quasi-analog models of large systems of algebraic  
equations 16 p0433 A77-46959  
Microcomputer processor for monitoring of solar  
heated buildings 16 p0481 A77-49015  
Directory of Federal energy data sources:  
Computer products and recurring publications  
[PB-254163/9] 13 p0093 A77-10941  
Applying computer-drawn maps of geologic data to  
analysis of mining problems [PB-255497/0] 13 p0096 A77-11518
- COMPUTERIZED DESIGN**  
Design principles for solar and wind power  
installations 13 p0015 A77-11922  
Heat pipe heat exchanger design considerations 13 p0031 A77-12765  
Long term performance prediction of residential  
solar energy heating systems 13 p0039 A77-12822  
Software aspects of super composites ---  
composition selection to meet user requirements 13 p0053 A77-15301  
Arrays of fixed flat-plate solar energy collectors  
- Performance comparisons for differing  
individual component orientations 13 p0068 A77-18449  
Computational program for accurate  
predetermination of irradiance and illuminance  
in connection with solar energy utilization 14 p0147 A77-21777  
A practical solar concentrator 14 p0171 A77-23657  
Efficiency calculations for Al/x/Ga/1-x/As-GaAs  
heteroface solar cells 15 p0257 A77-30720  
Re-entrant groove heat pipe --- computerized  
design for OAO applications [AIAA PAPER 77-773] 15 p0312 A77-37280  
An optimization approach to the design of the  
preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207

## COMPUTERIZED SIMULATION

## SUBJECT INDEX

- Conceptual heliostat field design for the ERDA 5  
Megawatt Solar Thermal Test Facility at Sandia,  
Albuquerque 15 p0318 A77-38209
- Conceptual design of a parabolic dish solar  
collector using simulation techniques 15 p0318 A77-38211
- An integrated process model of the Fischer-Tropsch  
process for liquid fuels production from coal 15 p0318 A77-38213
- A site sensitive solar collector evaluator 16 p0473 A77-48947
- Solar heating and cooling computer analysis - A  
simplified sizing design method for non-thermal  
specialists 16 p0497 A77-49157
- Innovative Aircraft Design Study (IADS) task 2,  
volume 1 [AD-A041234] 16 p0531 N77-31141
- COMPUTERIZED SIMULATION**
- Equation solution accuracy in calculating jet  
engine characteristics 13 p0020 A77-12502
- Modeling residential energy use 13 p0027 A77-12726
- Economic optimization of binary fluid cycle power  
plants for geothermal systems 13 p0029 A77-12744
- The use of program GEOTRM to design and optimize  
geothermal power cycles 13 p0031 A77-12758
- The potential national benefits of geothermal  
electrical energy production from hydrothermal  
resources in the West 13 p0031 A77-12760
- Alternative strategies for implementing  
silicon-ribbon technology for photovoltaic  
applications 13 p0039 A77-12819
- Optimal material selection for flat-plate solar  
energy collectors utilizing commercially  
available materials 13 p0068 A77-18444
- A new method for collector field optimization ---  
computerized simulation of solar tower facility 13 p0074 A77-19070
- Solar-powered housing unit - Simulation of solar  
heating and cooling in Saudi Arabia 13 p0078 A77-19110
- A comparison of solar absorption air conditioning  
systems 14 p0158 A77-22647
- Simulation of wind turbine generator system power  
flow dynamics 14 p0158 A77-22650
- The computer simulation of automobile use patterns  
for defining battery requirements for electric  
cars 14 p0159 A77-22879
- Method for estimating solar heating and cooling  
system performance 14 p0170 A77-23653
- Recovery of heat energy from deep or shallow  
aquifers 14 p0175 A77-24206
- An economic analysis of thermic diode solar panels  
[ASME PAPER 76-WA/SOL-7] 14 p0188 A77-26512
- Design and simulation studies for the Shenandoah  
Community Center large-scale solar cooling  
demonstration [ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520
- Modeling of electric drive systems for KEW  
/flywheel/ vehicles 14 p0200 A77-29469
- Studies on the energy system of Hokkaido. I -  
First attempt: Model-I. II - Various data and  
their basis. III - Simulations by Model-I 15 p0287 A77-33526
- Residential energy use alternatives to the year 2000  
15 p0307 A77-36768
- The Wisconsin Regional Energy project - An applied  
systems analysis approach to regional  
energy/environment modeling 15 p0309 A77-36825
- Computer model of a solar-assisted heating design  
approach implemented on a minicomputer  
installation 15 p0318 A77-38178
- Modeling aspects of a gas turbine solar-electric  
power system 15 p0318 A77-38210
- Conceptual design of a parabolic dish solar  
collector using simulation techniques 15 p0318 A77-38211
- A United States energy model economically driven  
by a global growth simulation 15 p0319 A77-38220
- A solar heating system simulation model 15 p0319 A77-38222
- Heat and mass transfer analysis of Bacon-type  
hydrogen-oxygen fuel cells - The volume average  
velocity 15 p0321 A77-38531
- Study of the maximum Hall voltages and  
interelectrode breakdown in the channel of an  
open-cycle MHD generator - A joint U.S.-U.S.S.R.  
experiment on the UO2 facility MHD generator 15 p0329 A77-39554
- U.S. options for a transition from oil and gas to  
synthetic fuels 15 p0335 A77-39836
- Simulation analysis of passive solar heated  
buildings - Preliminary results 16 p0406 A77-41582
- The interaction of batteries and fuel cells with  
electrical distribution systems - Force  
commutated converter interface 16 p0414 A77-42635
- Hybrid simulation of fuel cell power conversion  
systems 16 p0414 A77-42636
- Solar heating for a sports complex in Belgium 16 p0417 A77-42958
- On the theory and solar application of inductive  
grids --- wave diffraction modeling and far IR  
measurement 16 p0419 A77-43556
- Domestic hot water and solar energy in Ireland 16 p0430 A77-46608
- A study of the effects of new transportation  
systems on urban transportation and environment  
by computer simulation 16 p0430 A77-46652
- Numerical model of coal gasification in a packed bed 16 p0440 A77-48175
- Reaction rate analysis of borehole 'in-situ'  
gasification systems 16 p0440 A77-48177
- Computer predicted compression ratio effects on  
NOx emissions from a methanol fueled SI engine 16 p0444 A77-48706
- Coal gasification combined-cycle pilot plant  
system analysis 16 p0446 A77-48724
- Deterministic insolation estimates for solar total  
energy systems 16 p0462 A77-48847
- The use of planar reflectors for increasing the  
energy yield of flat-plate collectors 16 p0472 A77-48937
- Mathematical modeling of solar concentrators 16 p0473 A77-48949
- Simulation study of several solar heating systems  
with offpeak auxiliary 16 p0479 A77-49001
- Unified simulation capability for solar heating  
and cooling system analysis 16 p0479 A77-49003
- The feasibility of solar house heating - A study  
in applied economics 16 p0493 A77-49117
- Hybrid simulation of solar HVAC system for house  
retro-fit design [PB-252608/5] 13 p0090 N77-10676
- A simulation analysis of US energy demand, supply,  
and prices [PB-254314/8] 13 p0090 N77-10680
- Computer modeling of coal gasification reactors  
[PB-1770-4] 13 p0093 N77-10812
- The use of an interactive energy model for  
technology assessment with special reference to  
underground coal gasification [PB-255543/1] 13 p0098 N77-11545
- Commercial building unitary heat pump system with  
solar heating [PB-255488/9] 13 p0099 N77-11551



## SUBJECT INDEX

## CONDENSERS (LIQUIFIERS)

- The intersectoral feedback model  
[PB-255859/1] 13 p0125 N77-14950
- A design procedure for solar heating systems  
13 p0128 N77-15485
- Penetration analysis and margin requirements  
associated with large-scale utilization of solar  
power plants  
[PB-257546/2] 14 p0208 N77-16459
- Optimization of absorption air-conditioning for  
solar energy applications  
[NASA-CR-150176] 14 p0210 N77-17560
- Computer modeling of a regenerative solar-assisted  
Rankine power cycle  
14 p0218 N77-19112
- User manual for GEOCOST: A computer model for  
geothermal cost analysis. Volume 2: Binary  
cycle version  
[BNWL-1942-V2] 15 p0345 N77-22632
- WATSON: A solar heating simulation and economic  
evaluation program  
[NP-21307] 15 p0364 N77-24603
- Summary description of the BOOM1 model ---  
simulating power plant impact on isolated  
communities  
[LA-6424-MS] 15 p0369 N77-25010
- Modeling and optimization of geothermal power  
plants using the binary fluid cycle  
[BNWL-2112] 16 p0521 N77-29609
- An experimental study supported by a computer  
simulation in a prechamber CFR diesel engine  
leading to a modified cetane scale for rating  
low ignition quality fuels  
16 p0525 N77-30259
- Numerical simulation of United States Gulf Coast  
geothermal geopressured reservoirs  
16 p0545 N77-32585
- A finite element model for the analysis of  
waterflood performance  
[SPF71-A75036] 16 p0551 N77-33464
- CONCENTRATORS**
- Ideal concentrators for finite sources and  
restricted exit angles --- parabolic solar  
collector  
13 p0003 A77-10835
- Vortex kinetic energy concentrator  
13 p0044 A77-12870
- Irradiation field formation on the receiver of  
'precise' and 'unprecise' solar concentrators  
13 p0057 A77-16209
- Optical and thermal properties of Compound  
Parabolic Concentrators  
14 p0157 A77-22641
- Four different views of the heliostat flux density  
integral  
14 p0158 A77-22645
- Method of designing profiles of focusing  
concentrators and focusing wedges --- for  
parabolic solar concentrators  
14 p0179 A77-25355
- Experimental facility for measuring spatial and  
energy characteristics of solar concentrators  
14 p0179 A77-25356
- Concentrating power of spherical facets  
14 p0179 A77-25357
- Composite concentrators with spherical radiation  
sources  
14 p0179 A77-25359
- Development of compound parabolic concentrators  
for solar thermal applications  
[ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516
- Photovoltaic energy conversion using concentrated  
sunlight  
14 p0203 A77-29579
- GaAs solar cells for very high concentrations  
14 p0204 A77-29581
- Solar collectors using total internal reflections  
14 p0204 A77-29596
- Non-focussing solar concentrators of easy  
manufacture  
15 p0256 A77-30322
- Combination of focusing concentrators and focusing  
lenses  
15 p0286 A77-33431
- Paraboloid-hyperboloid concentrating systems and  
their accuracy  
15 p0286 A77-33433
- Method for calculating the profiles of focones and  
foclines --- for parabolic solar concentrators  
16 p0409 A77-41905
- Experimental setup for measuring space and energy  
characteristics of solar concentrators  
16 p0409 A77-41906
- Concentrating capability of spherical facets ---  
for solar concentrator applications  
16 p0409 A77-41907
- Composite concentrators with spherical radiation  
sources --- in solar heating systems  
16 p0409 A77-41909
- Photon trapping and energy transfer in  
multiple-dye plastic matrices - An efficient  
solar-energy concentrator  
16 p0418 A77-43070
- Combination of focones and foclines with radiation  
receivers  
16 p0427 A77-45544
- Paraboloid-hyperboloid concentrating systems and  
their accuracy  
16 p0427 A77-45546
- Shortened focusing concentrators and focusing wedges  
--- solar energy technology  
16 p0442 A77-48521
- High temperature solar collector with an  
Archimedes concentrator  
16 p0460 A77-48833
- Mathematical modeling of solar concentrators  
16 p0473 A77-48949
- An analytical and experimental evaluation of the  
plano-cylindrical Fresnel lens solar concentrator  
16 p0473 A77-48952
- Characteristics of the concentrated solar flux  
produced by the FMSC prototype --- Fixed Mirror  
Solar Concentrator  
16 p0474 A77-48953
- The performance of a stationary reflector/tracking  
absorber solar concentrator  
16 p0474 A77-48954
- Collector with cusplike compound parabolic  
concentrator and selective absorber  
16 p0474 A77-48955
- Optical and thermal design considerations for  
ideal light collectors  
16 p0474 A77-48956
- Solar process heat from concentrating flat-plate  
collectors  
16 p0474 A77-48957
- A compound parabolic concentrator array optimized  
for northern climates --- cold weather effects  
on solar collectors  
16 p0474 A77-48958
- Terrestrial concentrating photovoltaic power  
system studies  
16 p0486 A77-49058
- A note of the economics of deep cylindrical mirror  
concentrating collectors  
16 p0502 A77-50218
- Effect of angular misorientation on the  
performance of conical, spherical and parabolic  
solar concentrators  
16 p0502 A77-50221
- High-efficiency solar concentrator  
13 p0083 N77-10104
- Attic concentrator type solar energy collector  
[BNL-50493] 13 p0098 N77-11539
- Solar energy concentration  
[COO-2446-7] 14 p0220 N77-19584
- A non-tracking solar energy collector system  
[NASA-CASE-NPO-13817-1] 16 p0513 N77-28583
- Three-dimensional tracking solar energy  
concentrator and method for making same  
[NASA-CASE-NPO-13736-1] 16 p0545 N77-32583
- CONCORDE AIRCRAFT**
- Concorde - Endurance flights results  
13 p0016 A77-12114
- Oversight hearings on the SST  
[GPO-76-492] 15 p0376 N77-26107
- CONCRETES**
- A non-technical evaluation of four different  
concrete wall solar collector configurations  
16 p0478 A77-48990
- Concrete placing techniques used during the  
construction of the kasnoyarsk hydroelectric  
power plant  
[AD-A026967] 13 p0121 N77-14528
- CONDENSERS (LIQUIFIERS)**
- Solar house heating system using reflective  
pyramid optical condensing system  
[COO-2769-4] 16 p0522 N77-29619

## CONDENSING

- A study of the efficiency of hydrogen liquefaction  
--- jet aircraft applications 15 p0279 A77-33377
- The effect of dropwise condensation on glass solar  
properties 16 p0422 A77-44485
- An investigation of condensation heat transfer in  
a closed tube containing a soluble  
noncondensable gas  
[NASA-CR-149095] 13 p0085 N77-10465
- CONDUCTING FLUIDS
- Experimental investigation of energy conversion  
efficiency during the interaction of a  
conducting-fluid piston with a magnetic field  
14 p0204 A77-29618
- CONDUCTIVE HEAT TRANSFER
- Investigation of the thermophysical  
characteristics of low-temperature heat pipes  
with metal-fiber wicks 13 p0050 A77-14321
- Characteristic equations of unconcentrated flat  
solar cell panels 13 p0052 A77-14929
- Axial conduction in a flat-plate solar collector  
13 p0068 A77-18447
- Automotive hydride tank design 15 p0282 A77-33399
- The flow of heat from the earth's interior  
16 p0408 A77-41800
- Natural convection phenomena in inclined cells  
with finite side-walls - A numerical solution  
--- solar energy absorption cells 16 p0500 A77-50201
- Numerical solution of heat conduction with phase  
change in cylindrical systems 16 p0543 N77-32422
- CONDUCTORS
- The 275 deg C microcircuitry: Resistors,  
capacitors, conductors, substrates, and bonding  
[SAND-76-0611] 15 p0389 N77-27312
- CONFERENCES
- Aspects of energy conversion; Proceedings of the  
Summer School, Lincoln College, Oxford, England,  
July 14-25, 1975 13 p0004 A77-11026
- Energy: Mathematics and models; Proceedings of the  
Conference, Alta, Utah, July 7-11, 1975 13 p0008 A77-11233
- Intersociety Energy Conversion Engineering  
Conference, 11th, State Line, Nev., September  
12-17, 1976, Proceedings. Volumes 1 & 2 13 p0020 A77-12662
- An advanced energy conservation technology  
program; Proceedings of the Intersociety  
Workshop Conference, Airlie House, Va., March  
24-26, 1976 13 p0045 A77-12928
- National Meeting on Air and Space Law, 7th,  
Universidad Nacional de Cordoba, Cordoba and La  
Palda, Argentina, August 13-16, 1975, Proceedings  
13 p0053 A77-15050
- Helio technique and development; Proceedings of the  
International Conference, Dhahran, Saudi Arabia,  
November 2-6, 1975. Volumes 1 & 2 13 p0072 A77-19043
- Engineering aspects of magnetohydrodynamics;  
Proceedings of the Fifteenth Symposium,  
University of Pennsylvania, Philadelphia, Pa.,  
May 24-26, 1976 14 p0139 A77-21214
- International Conference on Solar Electricity,  
Toulouse, France, March 1-5, 1976, Reports  
14 p0147 A77-21776
- American Society of Heating, Refrigerating and  
Air-Conditioning Engineers, Semiannual Meeting,  
Dallas, Tex., February 1-5, 1976, Proceedings  
14 p0167 A77-23438
- American Society of Heating, Refrigerating and  
Air-Conditioning Engineers, Annual Meeting,  
Seattle, Wash., June 27-July 1, 1976, Proceedings  
14 p0170 A77-23651
- National Solar Energy Convention, Jadavpur  
University, Calcutta, India, November  
29-December 1, 1976, Proceedings 14 p0177 A77-24659

- Energy LA: Tackling the crisis; Proceedings of the  
Second Greater Los Angeles Area Energy  
Symposium, Los Angeles, Calif., May 19, 1976  
14 p0184 A77-26076
- Principles and application of systems in  
engineering as rational aid for economy, state,  
and research; Meeting, Bonn, West Germany,  
November 9, 10, 1976, Communications  
14 p0191 A77-27032
- Power Sources Symposium, 27th, Atlantic City,  
N.J., June 21-24, 1976, Proceedings  
14 p0195 A77-28126
- Principles of solar technology I; Meeting, 2nd,  
Stuttgart, West Germany, October 22, 1976, Reports  
14 p0201 A77-29562
- Optics in solar energy utilization II; Proceedings  
of the Seminar, San Diego, Calif., August 24,  
25, 1976 14 p0203 A77-29576
- World Hydrogen Energy Conference, 1st, Miami  
Beach, Fla., March 1-3, 1976, Proceedings.  
Volumes 1, 2 & 3 15 p0273 A77-33326
- Energy and the environment; Proceedings of the  
Third National Conference, Oxford, Ohio,  
September 29-October 1, 1975 15 p0291 A77-35146
- Space Congress, 14th, Cocoa Beach, Fla., April  
27-29, 1977, Proceedings 15 p0294 A77-35301
- Space manufacturing facilities: Space colonies;  
Proceedings of the Princeton Conference,  
Princeton University, Princeton, N.J., May 7-9,  
1975 15 p0295 A77-35801
- Synthetic fuels processing: Comparative economics;  
Proceedings of the Symposium, New York, N.Y.,  
April 4-9, 1976 15 p0300 A77-36326
- Space shuttle missions of the 80's; Proceedings of  
the Twenty-first Annual Meeting, Denver, Colo.,  
August 26-28, 1975. Parts 1 & 2 15 p0304 A77-36526
- Symposium on Gasification and Liquefaction of  
Coal, Duesseldorf, West Germany, January 12-16,  
1976, Reports 15 p0307 A77-36806
- Clean fuels from biomass, sewage, urban refuse,  
agricultural wastes; Proceedings of the  
Symposium, Orlando, Fla., January 27-30, 1976  
15 p0313 A77-37652
- Symposium on the Engineering Aspects of  
Magnetohydrodynamics, 16th, University of  
Pittsburgh, Pittsburgh, Pa., May 16-18, 1977,  
Proceedings 15 p0325 A77-39526
- Particle Accelerator Conference: Accelerator  
Engineering and Technology, Chicago, Ill., March  
16-18, 1977, Proceedings 15 p0334 A77-39742
- Solar energy: Applications, systems, experience;  
Lecture and Discussion Meeting, Essen, West  
Germany, February 4, 1977, Reports 15 p0335 A77-39976
- New options in energy technology; Proceedings of  
the Conference, San Francisco, Calif., August  
2-4, 1977 16 p0402 A77-41551
- Cryogenic Engineering Conference, Queen's  
University, Kingston, Ontario, Canada, July  
22-25, 1975, Proceedings 16 p0410 A77-42151
- Environmental Pollution Symposium on Practical  
Alternatives to Present Urban Life, 5th, Menlo  
Park, Calif., May 12, 13, 1976, Proceedings  
16 p0415 A77-42854
- Conference on Portable Power Sources in India,  
1st, Calcutta, India, May 27, 28, 1976,  
Proceedings 16 p0420 A77-44052
- Symposium on Engineering Problems of Fusion  
Research, 6th, San Diego, Calif., November  
18-21, 1975, Proceedings 16 p0425 A77-44975
- Power plants and future fuels; Proceedings of the  
Conference, London, England, January 21, 22, 1975  
16 p0428 A77-45956

## SUBJECT INDEX

## CONFERENCES CONTD

Gas turbines - Status and prospects; Proceedings of the Symposium, London, England, February 4, 5, 1976 16 p0428 A77-46401

New themes for space: Mankind's future needs and aspirations; Proceedings of the Bicentennial Space Symposium, Washington, D.C., October 6-8, 1976 16 p0430 A77-46627

Space and energy; Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975 16 p0432 A77-46787

Energy from solid waste utilization; Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, University of Rhode Island, Kingston, R.I., July 8, 9, 1975 16 p0433 A77-47210

Symposium on Clean Fusion, 1st, Washington, D.C., April 30, 1976, Proceedings 16 p0435 A77-47355

Symposium on Combustion /International/, 16th, Massachusetts Institute of Technology, Cambridge, Mass., August 15-20, 1976, Proceedings 16 p0439 A77-48158

Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings. Volumes 1 & 2 16 p0443 A77-48701

Sharing the sun: Solar technology in the seventies; Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volumes 1-10 16 p0469 A77-48910

Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018

International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings 16 p0500 A77-49753

Advances in engineering science, volume 3 [NASA-CP-2001-VOL-3] 13 p0084 A77-10305

Creating energy choices for the future. Public meeting on A National Plan for Energy Research, Development, and Demonstration [CONF-751228-P2] 13 p0087 A77-10646

Creating energy choices for the future [CONF-751228-P1] 13 p0087 A77-10647

CCMS solar energy pilot study solar heating and cooling systems in buildings [UMD-4908-5] 13 p0088 A77-10657

Energy: The policy planning framework in state governments. Volume 1: Summary report [PB-254466/6] 13 p0089 A77-10665

Energy: The policy planning framework in state governments. Volume 2: Appendices [PB-254467/4] 13 p0089 A77-10666

The proceedings of the NOx Control Technology Seminar [PB-253661/3] 13 p0092 A77-10707

Meeting report: Advanced fossil fuels sector group [PB-255117/4] 13 p0099 A77-11549

Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems [PB-253097/0] 13 p0099 A77-11556

Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy [PB-255656/7] 13 p0100 A77-11561

Conference report: Energy Conservation in Transportation and Construction [PB-255657/5] 13 p0100 A77-11562

Research to anticipate environmental impacts of changing resource usage [PB-256293/2] 13 p0101 A77-11602

The electric factor in catalysis on metals electrocatalysis on non-metallic surfaces [PB-256264/3] 13 p0103 A77-12166

Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game [PB-255607/4] 13 p0105 A77-12502

Conference proceedings, Energy from the Oceans, Fact or Fantasy [PB-256093/6] 13 p0108 A77-12547

Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB-255317/0] 13 p0110 A77-12597

Proceedings of the Stationary Source Combustion Symposium. Volume 1. Fundamental research [PB-256320/3] 13 p0116 A77-13569

Proceedings of the Stationary Source Combustion Symposium. Volume 2. Fuels and process research and development [PB-256321/1] 13 p0116 A77-13570

NASA Office of Aeronautics and Space Technology Summer Workshop. Volume 4: Power technology panel [NASA-TM-X-73964] 13 p0117 A77-13913

Heat pipes, volume 2 --- conference proceedings, Bologna, 31 Mar. - 2 Apr. 1976 [ESA-SP-112-VOL-2] 13 p0119 A77-14378

Proceedings of the Stationary Source Combustion Symposium. Volume 3: Field Testing and Surveys [PB-257146/1] 13 p0125 A77-14643

Second Environmental Aspects of Fuel Conversion Technology Symposium [PB-257182/6] 13 p0125 A77-14645

Abstracts: 1976 AFOSR Contractors' meeting on MHD Power Generation and Lasers [AD-A027654] 13 p0133 A77-15845

First Workshop on Sampling Geothermal Effluents [PB-258067/8] 14 p0207 A77-16433

Proceedings of National Conference on Health, Environmental Effects, and Control Technology of Energy Use [PB-256845/9] 14 p0208 A77-16453

Proceedings of a Symposium on Offshore Oil Potential and Related Land Use Impacts in the Central California Coastal Zone [PB-259074/3] 14 p0215 A77-18547

Proceedings of the 3rd Annual Energy Conservation Management Conference [PB-258652/7] 14 p0218 A77-18594

Energy storage: User needs and technology applications [CONF-760212-SUMM] 14 p0222 A77-19604

First World Hydrogen Energy Conference proceedings, volume 2 14 p0238 A77-21591

First World Hydrogen Energy Conference proceedings, volume 3 14 p0243 A77-21626

Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization [CONF-760222-P4] 14 p0248 A77-21675

Proceedings of Second Geopressured Geothermal Energy Conference. Volume 2: Resource Assessment [CONF-760222-P2] 14 p0249 A77-21677

Proceedings of Second Geopressured Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3] 14 p0249 A77-21678

Workshop on Geothermal Reservoir Engineering [PB-261319/8] 14 p0251 A77-21709

Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 2: Solar electric power [PB-260595/4] 14 p0252 A77-21722

Proceedings of 2nd Workshop on Materials Problems Associated with the Development of Geothermal Energy Systems [PB-261349/5] 14 p0252 A77-21725

Variable Geometry and Multicycle Engines [AGARD-CP-205] 15 p0339 A77-22112

Electric utility finance workshop [PB-261661/3] 15 p0349 A77-22677

Geothermal Energy and Wind Power: Alternate energy sources for Alaska [PB-261521/9] 15 p0349 A77-22678

Report of the National Research Council Committee on Nuclear and Alternative Energy Systems [PB-263595/1] 15 p0367 A77-24633

Energy in Perspective: An orientation conference for educators [CONF-760677] 15 p0373 A77-25648

International Conference on Hydrogen and its Prospects [AD-A036936] 15 p0385 A77-26696

Proceedings of a workshop on environmental oceanography of the Gulf of Mexico [ORO-5017-1] 15 p0386 A77-26787

- Prevention of Failures in Coal Conversion Systems: Proceedings of the 24th Meeting of the Mechanical Failures Prevention Group [PB-265552/0] 15 p0395 N77-27563
- Creating energy choices for the western region [ERDA-76-1-PH-3] 16 p0515 N77-28605
- FEA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers [PB-265706/2] 16 p0517 N77-28615
- Proceedings of the ASPE/MSFC Symposium on Engineering and Productivity Gains from Space Technology [NASA-CP-2019] 16 p0525 N77-30273
- Energy Technologies for the West: Geothermal; Energy from the earth [TID-27431] 16 p0537 N77-31642
- Energy Technologies for the West: Can the Individual's Voice be Heard; Public Participation in Energy Planning [TID-27433] 16 p0537 N77-31643
- Energy technologies for the West: The Fossil Option [TID-27430] 16 p0537 N77-31644
- Energy technologies for the West: General Session, volume 2 [TID-27427] 16 p0538 N77-31646
- Energy technologies for the West: Fission as an option [TID-27432] 16 p0538 N77-31647
- Energy Technologies for the West: Economic Growth and Energy [TID-27429] 16 p0538 N77-31648
- National energy projections and plans of the USA [IAEA-CN-36/397] 16 p0548 N77-32619
- Energy technologies for the West: Possible effects of Energy Technology on Land, Water, and Air Resources [TID-27444] 16 p0556 N77-33632
- Public participation in energy related decision making, edited transcripts [PB-268781/2] 16 p0559 N77-33674
- CONGRESSIONAL REPORTS**
- Inventory of energy research and development (1973 - 1975), volume 1 [GPO-64-734-VOL-1] 13 p0113 N77-13525
- Inventory of energy research and development (1973 - 1975), volume 2 [GPO-64-734-VOL-2] 13 p0113 N77-13526
- Inventory of energy research and development (1973 - 1975), volume 3 [GPO-64-734-VOL-3] 13 p0113 N77-13527
- Inventory of energy research and development (1973 - 1975), volume 4 [GPO-64-734-VOL-4] 13 p0113 N77-13528
- Inventory of energy research and development (1973 - 1975), volume 5 [GPO-64-734] 13 p0121 N77-14579
- Alternative fuels for aviation [GPO-78-544] 13 p0127 N77-15212
- Report to Congress on the economic impact of energy actions [PB-256684/2] 14 p0208 N77-16450
- Aircraft fuel efficiency program [S-REPT-94-633] 14 p0209 N77-17032
- Report to Congress on the economic impact of energy actions [PB-257657/3] 14 p0218 N77-18596
- Aviation economics --- commercial airlines [GPO-73-830] 15 p0352 N77-23008
- Report to Congress by the Federal Aviation Administration on the energy efficiency of agency regulations [AD-A034611] 15 p0359 N77-24103
- Second quarterly report to US House and Senate Committees on Appropriations [PB-263418/6] 15 p0365 N77-24616
- Oversight hearings on the SST [GPO-76-492] 15 p0376 N77-26107
- Polar energy resources potential [GPO-76-187] 16 p0520 N77-29605
- The economics of solar home heating [GPO-85-329] 16 p0534 N77-31603
- FEA: Final reports on oil and gas resources, reserves, and productive capacities [GPO-80-748] 16 p0534 N77-31606
- Economic and budget impact of the President's energy proposals [GPO-93-689] 16 p0534 N77-31607
- Compilation of energy-related legislation. Volume 1: Oil, gas, and electric power [GPO-80-323] 16 p0534 N77-31608
- Compilation of energy-related legislation. Volume 2: Other energy legislation [GPO-80-324] 16 p0534 N77-31609
- NASA authorization, 1978, volume 1, part 2 [GPO-92-082] 16 p0542 N77-32031
- NASA authorization, 1978, volume 1, part 3 [GPO-92-294] 16 p0542 N77-32032
- The President's energy program [GPO-88-556] 16 p0552 N77-33599
- CONICAL BODIES**
- Investigation of composite radiant-energy concentrators with conical radiation sources [GPO-88-556] 14 p0143 A77-21313
- CONSERVATION**
- Automotive fuel saving system with on-board hydrogen generation and injection into IC engines [GPO-88-556] 14 p0242 N77-21618
- Environmental considerations of selected energy conserving manufacturing process options. Volume 11: Glass industry [PB-264277/5] 15 p0384 N77-26688
- CONSTRUCTION**
- Self sufficient energy integrated design and construction method for low cost-self help housing programs [GPO-88-556] 16 p0495 A77-49137
- Energy use in the contract construction industry [PB-245422/1] 13 p0099 N77-11557
- Energy use in the contract construction industry. Appendix A: Study methodology [PB-245423/9] 13 p0099 N77-11558
- Energy use in the contract construction industry. Appendix B: Assessment of construction equipment availability, energy requirements, and construction industry capacity to support Project Independence [PB-245424/7] 13 p0100 N77-11559
- Concrete placing techniques used during the construction of the kasnoyarsk hydroelectric power plant [AD-A026967] 13 p0121 N77-14528
- Energy use for building construction [COO-2791-2] 15 p0391 N77-27509
- Regional economic impacts of nuclear power plants [BNL-50562] 16 p0540 N77-31676
- Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems [PB-267832/4] 16 p0554 N77-33618
- CONSTRUCTION INDUSTRY**
- Daedalophobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada [GPO-88-556] 16 p0494 A77-49121
- NASA Technology Utilization House technical support package [NASA-TR-X-74686] 15 p0358 N77-24011
- CONSTRUCTION MATERIALS**
- Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials [GPO-88-556] 13 p0068 A77-18444
- Selection of structural materials for hydrogen pipelines and storage vessels [GPO-88-556] 15 p0281 A77-33390
- Plastics in systems of solar technology [GPO-88-556] 15 p0336 A77-39979
- Optimizing the use of materials and energy in transportation construction [PB-253713/2] 13 p0096 N77-11475
- Concrete-polymer materials for geothermal applications [BNL-20865] 15 p0340 N77-22263
- CONTACT POTENTIALS**
- Electric arc power collection for high-speed trains [GPO-88-556] 13 p0060 A77-16594
- CONTAMINANTS**
- Comparison of calculated and measured maximum aboveground air pollutant concentrations and their respective distances from the source of release of large power plants [ORNL-TR-4231] 15 p0386 N77-26712
- CONTINENTAL SHELVES**
- Economic limits of OCS production wells [PB-255320/4] 13 p0096 N77-11515

## SUBJECT INDEX

## CONVECTIVE FLOW

Identification and analysis of mid-Atlantic onshore OCS impact  
[PB-254925/1] 13 p0096 N77-11516

Outer continental shelf oil and gas costs and production volume: Their impact on the nation's energy balance to 1990  
[PB-262533/3] 15 p0343 N77-22604

Research and development assessment on safety and pollution control for outer continental shelf operations  
[AD-A034727] 15 p0357 N77-23635

A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2  
[PB-264706/3] 15 p0385 N77-26693

Alaska OCS socioeconomic studies program, literature survey  
[PB-269244/0] 16 p0549 N77-32681

**CONTROL**  
Evaluation of molten scrubbing for fine particulate control  
[PB-266092/6] 16 p0517 N77-28642

**CONTROL CONFIGURED VEHICLES**  
Hydrodynamic equilibrium conditions for AG(EH) main strut-pod foil system using flap incidence control  
[AD-A027521] 13 p0127 N77-15220

**CONTROL EQUIPMENT**  
The status of instrumentation and process control techniques for in situ coal gasification  
[PB-266092/6] 14 p0191 A77-26790

Small scale tests on control methods for some liquefied natural gas hazards  
[AD-A033522] 15 p0341 N77-22293

**CONTROL SIMULATION**  
Application of simulation studies to the design and improvement of fuel control systems for aviation turbine engines  
13 p0054 A77-15798

**CONTROLLABILITY**  
Controllability analysis for passively and actively controlled heat pipes  
[AIAA PAPER 77-776] 15 p0312 A77-37281

**CONTROLLED FUSION**  
Fusion power --- nuclear energy technology development  
13 p0005 A77-11034

Muon catalysed fusion for pellet ignition  
13 p0012 A77-11468

Current status of the magnetic fusion program  
13 p0035 A77-12792

The migma high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794

The prospect for fusion --- controlled nuclear fusion  
13 p0058 A77-16357

Concept of a fusion burner  
13 p0061 A77-17014

A possible correlation of the neutron yield to the electromechanic work in Bather-type plasma focus devices  
13 p0061 A77-17017

World survey of major facilities in controlled fusion research --- Book  
13 p0067 A77-18264

Overview of the ERDA fusion power program  
13 p0068 A77-18446

Lasers and controlled thermonuclear fusion. I  
14 p0135 A77-19918

Electron beam research at Sandia Laboratories, USA --- for inertial confinement fusion  
14 p0138 A77-20706

Superconducting induction coil for a doublet Tokamak experimental fusion power reactor  
14 p0144 A77-21376

Review on the IAEA workshop on large fusion Tokamak projects  
14 p0146 A77-21737

Overview of energy research and development administration inertial confinement fusion program  
14 p0146 A77-21744

Hydrodynamics and compression of a laser irradiated target --- fusion energy requirements  
14 p0146 A77-21745

The current state and prospects for development of controlled thermonuclear fusion  
14 p0157 A77-22537

Status and outlook of controlled nuclear fusion  
14 p0163 A77-23095

Ignition of a pulsed thermonuclear reaction by high-current ion beams  
14 p0164 A77-23106

Prospects for fusion energy  
14 p0178 A77-24928

A direct convertor based upon space charge effects  
14 p0184 A77-26160

Review of the conceptual design of a doublet fusion experimental power reactor  
[ASME PAPER 76-WA/NE-9] 14 p0188 A77-26494

Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496

State of the art of controlled fusion  
14 p0194 A77-27722

The laser solenoid - An alternate use of lasers in fusion power  
14 p0198 A77-28962

The future with fusion power  
14 p0205 A77-29938

The impact of the new energy technologies  
15 p0272 A77-33124

Thermonuclear fusion power  
15 p0296 A77-35920

Systems analysis of accelerator and storage ring systems for inertial fusion  
15 p0334 A77-39744

Design considerations for a migma advanced fuel fusion reactor  
15 p0334 A77-39747

Update on the development of 120-keV multi-megawatt neutral beam source  
15 p0335 A77-39749

Explosion compression of plasma up to critical values of thermonuclear microfusion. I, II  
16 p0400 A77-41201

Adapting the experience of DOD/Industry to developing fusion power reactors  
[AIAA 77-1019] 16 p0404 A77-41561

Heating of the Frascati Tokamak by means of quasi perpendicular neutral injection  
16 p0407 A77-41706

Symposium on Engineering Problems of Fusion Research, 6th, San Diego, Calif., November 18-21, 1975, Proceedings  
16 p0425 A77-44975

Symposium on Clean Fusion, 1st, Washington, D.C., April 30, 1976, Proceedings  
16 p0435 A77-47355

Clean fusion concepts and efforts - A survey  
16 p0435 A77-47356

Studies of deuterium-fueled Tokamak reactors  
16 p0435 A77-47357

The 1976 status of the Migma program of controlled fusion  
16 p0435 A77-47360

Impact of advanced fuel fusion on electric power transmission  
16 p0436 A77-47361

Fusion products detection system in Migmacell II  
16 p0436 A77-47363

Methods of 'tailoring' ion distributions in phase space /'morphodynamics'/ --- in Migma-type fusion reactors  
16 p0436 A77-47364

Conditions for a boron fusion reactor in the MeV range  
16 p0436 A77-47366

Advanced fuel fusion application to manned space propulsion  
16 p0436 A77-47367

Generalized criterion for controlled fusion  
16 p0436 A77-47368

Unified criterion for proximity to controlled fusion  
16 p0436 A77-47369

Optimization of confinement in a toroidal plasma subject to strong radial electric fields  
16 p0438 A77-47958

Development of new technologies for energy production in the Federal Republic of Germany  
16 p0505 A77-51157

Enhanced energy utilization from a controlled thermonuclear fusion reactor  
[PB-260653/1] 14 p0234 N77-20879

**CONVECTIVE FLOW**  
Storage tanks - A numerical experiment --- for solar heating  
14 p0180 A77-25898

## CONVECTIVE HEAT TRANSFER

- Increase in the efficiency of heat and power systems using large artificial accumulators of heat  
13 p0064 A77-17939
- Construction of two-dimensional steady-state solution of equations of a nonequilibrium magnetized plasma  
13 p0065 A77-18130
- Free thermal convection in geothermal fields - Physical understanding and mathematical modeling  
14 p0174 A77-24204
- Numerical solutions for steady free convection in island geothermal reservoirs  
14 p0174 A77-24205
- Study of the characteristics of convective heat transfer in cylindrical solar energy receivers by solving the conjugate problem of heat exchange  
15 p0316 A77-37771
- The rate of mass transfer in a solar regenerator  
15 p0323 A77-39109
- Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem  
16 p0437 A77-47427
- Natural Convection phenomena in inclined cells with finite side-walls - A numerical solution --- solar energy absorption cells  
16 p0500 A77-50201
- Similarity solutions for mixed convection from horizontal impermeable surfaces in saturated porous media  
[PB-261561/5] 15 p0342 A77-22432
- The influence of lateral mass efflux on free convection boundary layers in a saturated porous medium  
[PB-261558/1] 15 p0342 A77-22587
- CONVECTION**
- Environmental considerations of selected energy conserving manufacturing process options. Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 A77-26690
- CONVERTERS**
- Induction devices - A new type of magnetohydrodynamic converter  
14 p0198 A77-28786
- COOLANTS**
- Flight results of a cryogenic cooler designed for Meteorat  
[IAF PAPER 76-210] 13 p0003 A77-10942
- COOLING**
- Interim feasibility assessment method for solar heating and cooling of Army buildings  
[AD-A026588] 13 p0124 A77-14606
- Coefficient of performance for solar-powered space cooling systems  
[CONF-760618-1] 14 p0220 A77-19585
- Application of chemical dehumidification system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana  
[NASA-CR-149888] 14 p0228 A77-20560
- Application of a run around coil system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana  
[NASA-CR-149887] 14 p0229 A77-20561
- ERDA solar heating and cooling demonstration program structure  
[ERDA-76-81] 14 p0230 A77-20573
- Proceedings of an EPRI Workshop on Technologies for Conservation and Efficient Use of Electric Energy. Volume 1: Overview  
[PB-261469/1] 14 p0230 A77-20577
- Thermal energy storage for building heating and cooling applications  
[ORNL-TN-5700] 15 p0344 A77-22617
- Solar heating and cooling technical data and systems analysis  
[NASA-CR-150305] 15 p0378 A77-26611
- Photovoltaic-powered refrigerator experiment at Isle Royale National Park  
[NASA-TN-73703] 15 p0390 A77-27497
- Review of solar cooling  
[CONF-760842-9] 15 p0393 A77-27535
- Studies on methods of reducing heat losses from flat plate solar collectors  
[COO-2597-2] 15 p0395 A77-27554
- Cooling subsystem design in CUS solar house 3  
[COO-2858-1] 16 p0514 A77-28592

- Exploration of molecular sieve zeolites for the cooling of building with solar energy  
[PB-266055/3] 16 p0517 A77-28620
- Demonstration testing of a Vuilleumier cryocooler with an integral  
[AD-A042786] 16 p0547 A77-32599
- COOLING SYSTEMS**
- R&M - Today's heating and cooling vs. solar energy  
13 p0002 A77-10482
- Thermal evaluation of a house using a movable-insulation heating and cooling system  
13 p0019 A77-12407
- Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system  
13 p0020 A77-12665
- Energy conservation potential of Modular Integrator Utility Systems /MIUS/  
13 p0026 A77-12724
- Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800
- Optimizing solar cooling systems  
13 p0047 A77-13502
- Atlanta /Towns/ solar experiment - The lessons we learned  
13 p0047 A77-13503
- The Shenandoah Community Center - A total solar design concept  
13 p0047 A77-13506
- The problem of use of solar energy specific features of radiative, heat, and mass transfer in solar installations  
13 p0057 A77-16204
- Homeowner's guide to solar heating and cooling --- Book  
13 p0062 A77-17525
- Application of solar energy in the high-temperature range  
13 p0063 A77-17636
- Thermostatics and thermokinetics of a flat plate solar collector with constant heat capacity  
13 p0073 A77-19057
- Stationary solar concentrators for industrial heating and cooling  
13 p0074 A77-19069
- Survey of absorption refrigeration systems  
13 p0078 A77-19105
- Factors affecting the use of solar energy for cooling  
13 p0078 A77-19108
- Solar-powered housing unit - Simulation of solar heating and cooling in Saudi Arabia  
13 p0078 A77-19110
- Equations for cold production of an absorption refrigerating solar unit  
14 p0137 A77-20397
- Solar heating and cooling  
14 p0156 A77-22025
- Armature of the MIT-EPRI superconducting generator  
14 p0157 A77-22575
- Preliminary performance of CSU Solar House I heating and cooling system  
14 p0158 A77-22644
- A comparison of solar absorption air conditioning systems  
14 p0158 A77-22647
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Semiannual Meetings, Dallas, Tex., February 1-5, 1976, Proceedings  
14 p0167 A77-23438
- The University of Pennsylvania Solar Heating/Cooling System Program  
14 p0167 A77-23439
- The ASHRAE monograph on applications of solar energy for heating and cooling buildings  
14 p0167 A77-23441
- Design application using solar energy to control the environment in a major office building  
14 p0168 A77-23442
- Solar absorption air-conditioning performance in central Ohio  
14 p0168 A77-23443
- Solar energy retrofit for existing buildings  
14 p0168 A77-23444
- The use of commercially available absorption units on solar-powered cooling systems  
14 p0168 A77-23445

## SUBJECT INDEX

## COPPER SULFIDES

- Absorption cycles for air-cooled solar air conditioning  
14 p0168 A77-23447
- Selecting refrigerant-absorbent fluid systems for solar energy utilization  
14 p0168 A77-23448
- Method for estimating solar heating and cooling system performance  
14 p0170 A77-23653
- Initial test results for a solar-cooled townhouse in the mid-Atlantic region  
14 p0170 A77-23655
- A progress report on the national program for solar heating and cooling  
14 p0170 A77-23656
- Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes  
14 p0177 A77-24571
- Operational modes of solar heating and cooling systems  
14 p0180 A77-25899
- Design of a solar heating and cooling system for CSU Solar House II  
14 p0181 A77-25902
- Solar heating and cooling of a 25,500 square foot building  
14 p0181 A77-26054
- The New Mexico Department of Agriculture solar heated and cooled building  
[ASME PAPER 76-WA/SOL-10]  
14 p0189 A77-26515
- Design and simulation studies for the Shenandoah Community Center large-scale solar cooling demonstration  
[ASME PAPER 76-WA/SCL-15]  
14 p0189 A77-26520
- Cooling with solar energy  
15 p0268 A77-32401
- Combined cycles in single circuit solar refrigerating systems  
15 p0286 A77-33434
- Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions  
15 p0286 A77-33435
- Solar heating and cooling systems - A reality today  
15 p0292 A77-35154
- Solar cooling of a Florida welcome station - A demonstration  
15 p0294 A77-35319
- Cool it, sun --- space heating and cooling  
15 p0305 A77-36627
- The multistage heat pipe radiator - An advancement in passive cooling technology  
[AIAA PAPER 77-760]  
15 p0312 A77-37271
- Experimental solar heating-cooling system model tests of a full-scale building system  
15 p0319 A77-38224
- Geothermal heat - instead of electrically powered compression - proposed for cooling a small residence or office building  
15 p0335 A77-39818
- Heat transfer and resistance in rotating pipes /Review/  
16 p0402 A77-41361
- Cryogenic design for large superconductive energy storage magnets  
16 p0411 A77-42156
- Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids  
16 p0411 A77-42160
- Conjugate cycles of single-loop solar power and refrigeration plants  
16 p0427 A77-45547
- Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia  
16 p0427 A77-45548
- Development of a Stirling engine powered heat activated heat pump  
16 p0448 A77-48745
- Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications  
16 p0450 A77-48756
- Design of sodium-cooled, central receiver solar power plant  
16 p0461 A77-48843
- Parametric study of a dynamic solar powered absorption cycle  
16 p0475 A77-48961
- Modelling of a solar-operated absorption air conditioner system with refrigerant storage  
16 p0475 A77-48963
- Cooling subsystem design in CSU Solar House III  
16 p0475 A77-48964
- Coefficient of performance for solar-powered space cooling systems  
16 p0475 A77-48965
- Lessons learned from Atlanta /Towns/ solar experiment --- school building heating and cooling system  
16 p0476 A77-48971
- Steady-state and transient performance limitations of the ARKLA Solar absorption cooling system  
16 p0478 A77-48987
- The design of a solar cooling and heating system for a commercial building  
16 p0497 A77-49148
- Dual Phase Annual Cycle for residential heating and cooling --- by solar energy  
16 p0497 A77-49149
- Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation  
16 p0498 A77-49165
- Auxiliary power system for activity cooled aircraft [NASA-CASE-LAR-11626-1]  
13 p0103 N77-12332
- Measured performance of a 3 ton LiBr absorption water chiller and its effect on cooling system operation  
[NASA-TN-X-73496]  
13 p0105 N77-12518
- Effect of mechanical cooling devices on ambient salt concentration  
[PB-256679/2]  
13 p0125 N77-14631
- Aircraft power supplies and cooling problems: A viewpoint from the power conditioner designer  
14 p0207 N77-16039
- Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
[PB-257770/8]  
14 p0208 N77-16452
- Corrosion inhibitors for solar heating and cooling systems  
[NASA-TN-D-8409]  
14 p0210 N77-17198
- National program for solar heating and cooling of buildings: Project data summaries. Volume 1: Commercial and residential demonstration  
[ERDA-76-127]  
15 p0346 N77-22639
- Interim performance criteria for solar heating and cooling systems in commercial buildings  
[PB-262114/2]  
15 p0348 N77-22669
- Oil cooling system for a gas turbine engine  
[NASA-CASE-LEW-12830-1]  
15 p0353 N77-23106
- Atmospheric impacts of evaporative cooling systems  
[ANL-ES-53]  
15 p0367 N77-24643
- COPOLYMERIZATION**  
A petroleum substitute - Active CO2  
14 p0200 A77-29325
- COPPER**  
Environmental considerations of selected energy conserving manufacturing process options. Volume 14: Primary copper industry report  
[PB-264280/9]  
15 p0385 N77-26691
- Aluminum or copper substrate panel for selective absorption of solar energy and the method of producing said panel  
[NASA-CASE-MFS-23518-1]  
16 p0535 N77-31610
- COPPER OXIDES**  
Cuprous oxide Schottky photovoltaic cells as potential solar energy converters  
13 p0076 A77-19088
- COPPER SELENIDES**  
Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions  
14 p0149 A77-21801
- COPPER SULFIDES**  
CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica substrates  
13 p0007 A77-11110
- A sulfurization process for the preparation of photovoltaic Cu<sub>x</sub>/S and CuInS<sub>2</sub> thin films  
13 p0076 A77-19087
- Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells  
14 p0147 A77-21781
- Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell  
14 p0149 A77-21797

- Technology of large area Cu/x/S-CdS solar cells  
14 p0149 A77-21798
- Investigation on the crystalline structure of  
Cu/x/S-CdS solar cells  
14 p0149 A77-21803
- Design analysis of the thin-film CdS-Cu2S solar cell  
15 p0258 A77-30721
- Solar cells for terrestrial applications  
16 p0485 A77-49050
- CdS/Cu2S solar cells - A low-cost thin film  
polycrystalline photovoltaic device for  
terrestrial applications  
16 p0486 A77-49059
- Theoretical prospects of the CdS-Cu2S solar cell  
[PB-252409/8]  
13 p0089 A77-10672
- CORN**
- Interpretation of Pennsylvania agricultural land  
use from ERTS-1 data  
[E77-10111]  
14 p0215 A77-18525
- Systems study of fuels from sugarcane, sweet  
sorghum, sugar beets, and corn  
[TID-27336]  
15 p0377 A77-26324
- CORROSION**
- Proceedings of 2nd Workshop on Materials Problems  
Associated with the Development of Geothermal  
Energy Systems  
[PB-261349/5]  
14 p0252 A77-21725
- Corrosivity of geothermal brines  
[ORNL-TM-5688]  
15 p0359 A77-24265
- CORROSION PREVENTION**
- Problems related to operating thermal wells  
subject to scaling in Hungary  
14 p0163 A77-23035
- Corrosion prevention in aluminum solar systems  
15 p0270 A77-32602
- Corrosion problems in solar energy systems  
15 p0270 A77-32603
- Corrosion inhibitors for solar heating and cooling  
systems  
[NASA-TN-D-8409]  
14 p0210 A77-17198
- Study of corrosion and its control in aluminum  
solar collectors  
[COO-2934-76-1]  
15 p0383 A77-26673
- Prevention of Failures in Coal Conversion Systems:  
Proceedings of the 24th Meeting of the  
Mechanical Failures Prevention Group  
[PB-265552/0]  
15 p0395 A77-27563
- CORROSION RESISTANCE**
- Development of sodium/sulfur-cells  
13 p0026 A77-12716
- Progress on the testing of refractories for  
directly-fired MHD air heater service  
14 p0142 A77-21254
- Corrosion problems related to the employment of  
aluminum in collector construction  
14 p0202 A77-29566
- Inhibited ethylene glycol as the solar nexus  
15 p0270 A77-32601
- Sulfidation of 316 stainless steel at sulfur  
potentials encountered in coal conversion systems  
15 p0337 A77-40028
- Corrosion behavior of materials for  
coal-gasification applications  
15 p0337 A77-40029
- Metal dusting corrosion in coal gasification  
environments  
15 p0337 A77-40042
- Materials research and evaluation for geothermal  
corrosion environments --- alloys  
[COO-2602-2]  
14 p0210 A77-17216
- CORROSION TESTS**
- The compatibility of containment materials for  
thermochemical hydrogen production  
15 p0276 A77-33347
- Corrosion of potential MHD preheater materials in  
liquid slag and slag-steam  
15 p0327 A77-39541
- Generator wall slag coating and material corrosion  
experiments  
15 p0327 A77-39542
- The evaluation of electrode materials for slag  
coated MHD channels  
15 p0328 A77-39545
- Metallurgical evaluation of materials for  
geothermal power plant applications  
16 p0499 A77-49700
- Study of corrosion and its control in aluminum  
solar collectors  
[COO-2934-76-1]  
15 p0383 A77-26673
- CORRUGATING**
- Radiant transmittance of V-corrugated transparent  
sheets with application to solar collectors  
[ASME PAPER 76-WA/SOL-1]  
14 p0188 A77-26506
- COSMOLOGY**
- Space station systems analysis study. Part 1,  
volume 1: Executive study  
[NASA-CR-151102]  
13 p0094 A77-11084
- Space station systems analysis study. Part 1,  
volume 2: Technical report  
[NASA-CR-151103]  
13 p0094 A77-11085
- COST ANALYSIS**
- Energy in the household - Comparison of heating  
costs and prognosis concerning the consumption  
of energy until 1985  
13 p0015 A77-12059
- An analysis of electric vehicle mission, design,  
energy impact and cost  
13 p0024 A77-12700
- Energy transmission from ocean thermal energy  
conversion plants  
13 p0032 A77-12773
- Solar thermal electric power plants - Their  
performance characteristics and total social costs  
13 p0037 A77-12804
- Performance and cost analysis of photovoltaic  
power systems for on-site residential applications  
13 p0038 A77-12816
- The consumer's cost of electricity from windmills  
13 p0043 A77-12866
- Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility  
13 p0043 A77-12867
- Life-cycle costs and solar energy  
13 p0047 A77-13501
- Cost aspects of solar energy - Selective and  
critical bibliography  
13 p0054 A77-15799
- Geothermal energy development  
13 p0064 A77-17801
- Applications of new systems to urban transportation  
14 p0137 A77-20392
- French developments in silicon photovoltaic cells  
14 p0147 A77-21780
- Evaluation of CdS photovoltaic cells in the  
framework of the development of solar electric  
power plants  
14 p0149 A77-21796
- Use of solar water-heating installations in the  
combined cycle of a thermal electric power plant  
14 p0152 A77-21825
- Thermal energy of oceans  
14 p0153 A77-21833
- How six coal gasification processes compare  
economically  
14 p0165 A77-23308
- The thermal efficiency and cost of producing  
hydrogen and other synthetic aircraft fuels from  
coal  
14 p0171 A77-23718
- Solar heating in the United States  
[ASME PAPER 76-WA/SOL-8]  
14 p0188 A77-26513
- An overview of the U.S. energy dilemma  
14 p0192 A77-27294
- Energy and economic trade offs for advanced  
technology subsonic aircraft  
14 p0201 A77-29471
- Analysis of electrical power generation costs  
15 p0257 A77-30600
- Commodity hydrogen from off-peak electricity  
15 p0283 A77-33403
- The Greenland hydropower as a source of  
electrolytic hydrogen  
15 p0285 A77-33416
- Possible pollution and cost analysis from wide use  
of hydrogen fuel in transportation  
15 p0285 A77-33422
- Evaluating a combined wind power/energy storage  
system  
15 p0287 A77-33596
- The competitive market for commercial VSTOL  
[AIAA 77-573]  
15 p0290 A77-34933
- The development of net energy estimates for  
extraction, handling, and processing of selected  
fuels  
15 p0291 A77-35147
- A method for evaluating SO2 abatement strategies  
15 p0293 A77-35169



## SUBJECT INDEX

## COST EFFECTIVENESS

- Decision making in the utilisation of the organic fraction of municipal wastes 15 p0299 A77-36272
- Laser fusion - Capital cost of inertial confinement 15 p0300 A77-36318
- Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344
- Freeze protection for solar collectors 15 p0303 A77-36350
- An integrated process model of the Fischer-Tropsch process for liquid fuels production from coal 15 p0318 A77-38213
- Thermolysis or electrolysis - Why we choose the latter --- water splitting for hydrogen production 15 p0321 A77-38528
- Accounting methods for new-technology non-utility energy installations 15 p0322 A77-38675
- Alternatives to oil and gas through energy management [AIAA 77-1006] 16 p0403 A77-41553
- Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563
- Implementation issues of wind energy --- cost analysis [AIAA 77-1025] 16 p0404 A77-41565
- Cost studies on terrestrial photovoltaic power systems with sunlight concentration 16 p0405 A77-41579
- Solar ponds - Low cost solar energy management systems 16 p0408 A77-41851
- Solid fuels from biomass - Some environmental and economic considerations 16 p0445 A77-48712
- Geothermal power cycle analysis 16 p0455 A77-48803
- Solar thermal system requirements 16 p0481 A77-49017
- Silviculture energy plantations 16 p0488 A77-49079
- Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131
- Solar economics in Illinois 16 p0497 A77-49152
- A note of the economics of deep cylindrical mirror concentrating collectors 16 p0502 A77-50218
- Cost analysis of two air quality attainment strategies [PB-254182/9] 13 p0692 A77-10719
- Economic limits of OCS production wells [PB-255320/4] 13 p0096 A77-11515
- Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization [PB-254166/2] 13 p0101 A77-11581
- Coal gasification commercial concepts: Gas cost guidelines [FE-1235-1] 13 p0130 A77-15500
- Potential national benefits of geothermal electrical energy production from hydrothermal resources in the West [BNWL-SA-5798] 14 p0220 A77-19583
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle [UCRL-78390] 14 p0221 A77-19587
- Potential benefits of geothermal electrical production from hydrothermal resources [BNWL-2001] 14 p0221 A77-19591
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility [CONF-760906-8] 14 p0222 A77-19609
- US options for a transition from oil and gas to synthetic fuels 14 p0247 A77-21661
- Possible pollution and cost analysis from wide use of hydrogen fuel in transportation 14 p0247 A77-21664
- User manual for GECOST: A computer model for geothermal cost analysis. Volume 2: Binary cycle version [BNWL-1942-V2] 15 p0345 A77-22632
- Buying solar --- consumer information [PB-262134/0] 15 p0348 A77-22673
- Examination of the costs, benefits and energy conservation aspects of the NASA aircraft fuel conservation technology program [NASA-CR-152683] 15 p0352 A77-23007
- Effects of alternative oil stockpiling programs on the US economy, 1976-1979 [BNL-50541] 15 p0369 A77-24999
- Proceedings of the Solar Industrial Process Heat Workshop [CONF-760655] 15 p0373 A77-25643
- Application of the ice-maker heat pump to an annual cycle energy system [CONF-761107-13] 15 p0382 A77-26659
- Comparative cost study of the processes for producing niobium-tin (Nb3 Sn) superconducting tapes for their application to power transmission lines [ERDA-76-160] 15 p0387 A77-26999
- Study of Lyndon B. Johnson Space Center utility systems [NASA-TN-58196] 15 p0388 A77-27161
- Parametric study of critical fuel costs for solar heating in North America [CONF-760842-12] 15 p0392 A77-27533
- Market evaluation study: Solar domestic water heaters for DOD barracks [AD-A036479] 16 p0516 A77-28611
- Input-Output capital coefficients for energy technologies [BNL-50608] 16 p0524 A77-30027
- Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems [PB-267832/4] 16 p0539 A77-31663
- Cost estimation for a theta-pinch reactor [ANL-CTR-TN-40] 16 p0549 A77-32888
- Investigation of GaAs solar cell potential performance and cost [AD-A040736] 16 p0553 A77-33612
- Coal gasification study [AD-A041860] 16 p0554 A77-33615
- Solar energy: Policy and prospects [PB-267986/8] 16 p0554 A77-33620
- Design and cost study of a zinc/nickel oxide battery for electric vehicle propulsion [ANL-K-76-3543-1] 16 p0556 A77-33635
- COST EFFECTIVENESS**
- Making electricity from moderate temperature fluids --- geothermal sources 13 p0002 A77-10649
- Energy from wastes 13 p0006 A77-11038
- Principles of energy analysis 13 p0007 A77-11045
- Energy: A radical redirection 13 p0010 A77-11275
- The mysteries of nuclear programs --- energy conversion efficiency 13 p0011 A77-11337
- Electricity and heat production - Energy efficiency versus cost efficiency 13 p0011 A77-11338
- Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/ 13 p0013 A77-11524
- The Osmotic power plant 13 p0021 A77-12668
- Solar SMG - Large-scale production of SMG by anaerobic digestion of specially grown plant matter --- Synthetic Natural Gas 13 p0021 A77-12671
- Solar energy collection by bioconversion 13 p0021 A77-12672
- Solar-powered Rankine-cycle heat pump system 13 p0036 A77-12800
- The low cost high performance generator /LCHPG/ --- space Radioisotope Thermoelectric Generators 13 p0042 A77-12855
- Life-cycle costs and solar energy 13 p0047 A77-13501
- Windmills stage a comeback --- review 13 p0048 A77-13624
- Some material considerations involved in the application of solar energy to electric power generation 13 p0049 A77-13739

- Air transportation and fuel consumption  
13 p0051 A77-14563
- Studies and thoughts on nuclear reactor systems  
13 p0055 A77-15800
- Economic effectiveness of solar electric power stations  
13 p0063 A77-17556
- Nova Scotia seeks to cut oil bill for power generation  
13 p0063 A77-17588
- Solar photovoltaics - An aerospace technology [AIAA PAPER 77-293]  
13 p0065 A77-18225
- Solar thermal power generation  
13 p0077 A77-19095
- Combined solar and petroleum energy HVAC system for a commercial building in Dhahran --- Heating, Ventilating and Air Conditioning  
13 p0078 A77-19111
- Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system  
14 p0149 A77-21795
- 100 kilowatt-hours per day with RTC silicon solar cells  
14 p0153 A77-21835
- Materials and processing approaches to cost competitive wind turbine rotor blades  
14 p0157 A77-22144
- Economic competitiveness of solar energy with conventional fuels and electricity  
14 p0158 A77-22648
- Development cost effective battery electric road vehicles  
14 p0160 A77-22889
- Near-term advanced electric vehicle batteries  
14 p0161 A77-22909
- Some preliminary considerations on photovoltaic conversion of solar energy  
14 p0164 A77-23299
- Direct and indirect economics of wind energy systems relative to fuel based systems  
14 p0165 A77-23358
- Competitively priced hydrogen via high-efficiency nuclear electrolysis  
14 p0171 A77-23720
- An engine designer's view for advanced secondary power systems [AIAA PAPER 77-517]  
14 p0174 A77-23931
- Simulation and cost optimization of solar heating of buildings in adverse solar regions  
14 p0180 A77-25897
- Operational modes of solar heating and cooling systems  
14 p0180 A77-25899
- Solar energy for the Australian food processing industry  
14 p0181 A77-25900
- Cost optimal deployment of mirrors associated with a high temperature solar energy system  
14 p0181 A77-25901
- Performance of flat-plate collectors with planar reflectors [ASME PAPER 76-WA/HT-27]  
14 p0186 A77-26478
- Design and costs of high temperature thermal storage devices using salts or alloys [ASME PAPER 76-WA/HT-34]  
14 p0187 A77-26481
- Solar heating thermal storage feasibility [ASME PAPER 76-WA/HT-36]  
14 p0187 A77-26483
- Research and development of cryoalternators for large-electrical power systems  
14 p0190 A77-26536
- Possibilities and economic limits concerning solar heating  
14 p0197 A77-28679
- Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock  
14 p0200 A77-29437
- Effects of selected R&D options on fuel usage in the commercial air system  
14 p0201 A77-29472
- The law for saving energy and its significance for energy politics  
15 p0261 A77-31372
- Development of a low capital cost electrolyzer --- for hydrogen production  
15 p0277 A77-33362
- Potential structural material problems in a hydrogen energy system  
15 p0281 A77-33389
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution  
15 p0284 A77-33415
- Hydrogen in the seaward advancement of industrial societies --- offshore energy production  
15 p0285 A77-33417
- Photovoltaic systems --- solar energy conversion research for military applications  
15 p0288 A77-34112
- The relative advantages of coal conversion routes for electric power generation --- economics of large scale installations  
15 p0300 A77-36330
- Evaluation of the Lawrence Livermore Laboratory in-situ coal gasification concept  
15 p0300 A77-36332
- The IGT low-Btu gas process - Design and economics --- clean fuel gas from coal  
15 p0301 A77-36335
- Fuel gas production via Koppers-Totzek gasification - An economic analysis  
15 p0301 A77-36336
- Thermal storage - A sleeping giant  
15 p0304 A77-36427
- Economic benefits of energy conservation  
15 p0307 A77-36797
- Trends in western Europe --- lignite gasification cost effectiveness  
15 p0308 A77-36808
- Underground gasification --- of coal for deep deposit in situ processing  
15 p0308 A77-36813
- The economics of solar home heating systems for the southwest region  
15 p0309 A77-36824
- Solar energy depot --- using liquid hydrogen as fuel and oxygen as oxidizer [AIAA PAPER 77-726]  
15 p0311 A77-37251
- Future trends in electrical energy generation economics in the United States  
15 p0317 A77-37960
- Can we control the carbon dioxide in the atmosphere  
15 p0322 A77-38674
- Storage batteries - The case and the candidates [AIAA 77-1007]  
16 p0403 A77-41554
- Compressed air energy storage [AIAA 77-1008]  
16 p0403 A77-41555
- Utility views of MHD power generation [AIAA 77-1010]  
16 p0403 A77-41557
- Improvement in phosphoric acid cell powerplant technology [AIAA 77-1011]  
16 p0403 A77-41558
- Economic assessment of the utilization of fuel cells in electric utility systems [AIAA 77-1012]  
16 p0403 A77-41559
- Integration of solar generation into electric utility systems [AIAA 77-1020]  
16 p0404 A77-41562
- Perspectives on implementing OTEC power --- Ocean Thermal Energy Conversion [AIAA 77-1024]  
16 p0404 A77-41564
- A comparison of GaAs and Si hybrid solar power systems  
16 p0406 A77-41584
- Competitive restraints on air travel - Ground modes and telecommunications  
16 p0409 A77-41939
- The heat pump - An approach for saving energy  
16 p0421 A77-44450
- The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report [SAE PAPER 770081]  
16 p0424 A77-44559
- Impact of advanced fuel fusion on electric power transmission  
16 p0436 A77-47361
- System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications  
16 p0445 A77-48718
- Investigation of metal fluoride thermal energy storage materials  
16 p0451 A77-48767
- Large-scale thermal storage in rock - Construction, utilization, and economics  
16 p0451 A77-48769
- Geothermal space heating - The symbiosis with fossil fuel  
16 p0455 A77-48797

## SUBJECT INDEX

## COST ESTIMATES

Energy extraction characteristics of hot dry rock geothermal systems 16 p0455 A77-48798

Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California --- in geothermal resources exploitation 16 p0455 A77-48801

Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825

Design of sodium-cooled, central receiver solar power plant 16 p0461 A77-48843

Miniature solar-electric power system 16 p0462 A77-48848

Experimental evaluation of a solar/wind-powered space heating and hot water heating system in the Pacific Northwest 16 p0462 A77-48849

Solar residential demonstration program 16 p0469 A77-48914

Recent Canadian activities in biomass 16 p0470 A77-48917

ERDA Solar Thermal Energy Program for industrial process heat 16 p0470 A77-48922

Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923

Application of solar principles in designing a low cost system for warehouse heating 16 p0476 A77-48969

Cost effective solar heating of houses with seasonal storage of energy 16 p0481 A77-49016

Shallow solar ponds for industrial process heat - The ERDA-Sohio project 16 p0482 A77-49024

Economic aspects of Ocean Thermal Energy Conversion 16 p0484 A77-49041

Preliminary research on Ocean Energy Industrial Complexes 16 p0484 A77-49042

Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions 16 p0490 A77-49091

The application of wind power systems to the Minnesota Power and Light Company 16 p0490 A77-49092

Diffuser augmentation of wind turbines 16 p0490 A77-49093

Gravel and liquid storage system for solar thermal power plants 16 p0491 A77-49101

High-temperature energy storage in native rocks 16 p0492 A77-49104

Thermal energy storage using large hollow steel ingots 16 p0492 A77-49106

An assessment of hydrogen as a means to store solar energy 16 p0492 A77-49107

Thermal energy storage by the sulfuric acid-water system 16 p0492 A77-49108

Reinforced pillow solar water heater 16 p0493 A77-49114

Payback of solar systems --- cost effectiveness evaluation by dynamic economical model 16 p0493 A77-49115

The feasibility of solar house heating - A study in applied economics 16 p0493 A77-49117

A parametric study of critical fuel costs for solar heating in North America 16 p0493 A77-49118

Incentives and barriers to the development of solar energy 16 p0494 A77-49119

Effect of solar home heating on electric utilities 16 p0494 A77-49123

Economic study of solar total energy 16 p0494 A77-49124

User needs vs. technical demands, or the art of tradeoff in making a good, inexpensive solar home 16 p0495 A77-49134

Design factors for a cost effective solar collection system 16 p0496 A77-49143

Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638

Solid Polymer Electrolyte (SPE) fuel cell technology, program review, phase 2 [NASA-CR-150957] 13 p0097 N77-11532

Attic concentrator type solar energy collector [BNL-50493] 13 p0098 N77-11539

Cost/benefit assessment of the application of composite materials to subsonic commercial transport engines [NASA-TN-X-73557] 13 p0111 N77-13064

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137926] 13 p0126 N77-15007

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137927] 13 p0126 N77-15008

Hydrogen energy conversion --- for thermodynamic efficiency and cost effectiveness [AD-A030370] 14 p0218 N77-18601

Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis [NASA-CR-137923] 15 p0353 N77-23072

Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses [NASA-CR-137924] 15 p0353 N77-23073

Study to assess the application of shadow pricing techniques to national energy resource planning [BNL-50537] 15 p0369 N77-24997

Solar pond [NASA-CASE-WFO-13581-2] 16 p0513 N77-28584

Space station systems analysis study. Part 3: Documentation. Volume 1: Executive summary [NASA-CR-151503] 16 p0525 N77-30151

**COST ESTIMATES**

Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle 13 p0029 A77-12746

Is nuclear energy economically viable --- competition with coal 13 p0045 A77-12933

Air, water, nuclear power make gasoline 13 p0045 A77-12935

Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106

On the solar energy problem --- for heat and electric power production 14 p0138 A77-20742

A solar collector of glass 14 p0148 A77-21792

Low-Btu gas from coal has many potential markets 14 p0165 A77-23309

Liquefied natural gas for California 14 p0183 A77-26083

Solar thermal electric power systems - Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474

Microwave energy transmission [AIAA PAPER 77-540] 15 p0266 A77-32063

Economic evaluation by ERDA of alternative fossil energy technologies 15 p0300 A77-36328

Electrochemical energy conversion. I - Electric vehicle propulsion 15 p0303 A77-36410

Factors influencing the economics of large-scale in situ coal gasification operations 15 p0306 A77-36765

Computer model of a solar-assisted heating design approach implemented on a minicomputer installation 15 p0318 A77-38178

Options for the conversion of fossil fuels 15 p0335 A77-39835

Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552

## COST INCENTIVES

## SUBJECT INDEX

- Satellite solar power - Will it pay off  
[AIAA 77-1027] 16 p0404 A77-41567
- On the realization of projects - With special  
reference to O'Neill space colonies and the like  
16 p0431 A77-46770
- A preliminary cost benefit analysis of space  
colonization 16 p0431 A77-46771
- Photovoltaic applications for the National Park  
Service 16 p0460 A77-48837
- Comparative assessment of orbital and terrestrial  
central power plants 16 p0465 A77-48878
- Experience with a prototype solar pond for space  
heating 16 p0482 A77-49026
- Solar thermal electric power systems - Comparison  
of line focus collectors 16 p0483 A77-49032
- A comparison of the economics of nuclear and solar  
power 16 p0485 A77-49049
- Large windpower systems integrated with existing  
electric utilities 16 p0490 A77-49094
- An immiscible fluid - Heat of fusion energy  
storage system 16 p0493 A77-49113
- Economics of solar heating with homeowner-type  
financing 16 p0501 A77-50210
- Personal rapid transit research conducted at the  
Aerospace Corporation  
[PB-256E46/7] 13 p0111 N77-12946
- Electric power generation using geothermal brine  
resources for a proof-of-concept facility  
[NSP/RA/N-75-049] 13 p0123 N77-14603
- Initial technical environmental, and economic  
evaluation of space solar power concepts.  
Volume 2: Detailed report  
[NASA-TN-X-74310] 14 p0207 N77-16443
- Assessment and study of existing concepts and  
methods of cryogenic refrigeration for  
superconducting transmission cables  
[COO-2552-6] 14 p0214 N77-18352
- Federal support for the development of alternative  
automotive power systems: The general issue and  
the stirling, diesel, and electric cases  
[PB-263523/3] 15 p0354 N77-23518
- A review of the solar array manufacturing industry  
costing standards 16 p0528 N77-30608
- National benefits/costs of enhanced oil recovery  
research  
[FE-2021-4] 16 p0538 N77-31649
- COST INCENTIVES**
- Closed costs of electrical energy for different  
zones of load graphs of electrical energy systems  
16 p0437 A77-47751
- Stimulation of the solar industry by way of the  
Federal Buildings Program 16 p0462 A77-48850
- Incentives and barriers to the development of  
solar energy 16 p0494 A77-49119
- COST REDUCTION**
- The ERDA Photovoltaic Systems Definition Project  
13 p0038 A77-12815
- COSTEAM: Low-rank coal liquefaction - An updated  
analysis 13 p0045 A77-12934
- Solar energy and electric utilities - Should they  
be interfaced 14 p0143 A77-21281
- Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells  
14 p0147 A77-21781
- The current status of the U.S. Photovoltaic  
Conversion Program 14 p0147 A77-21782
- Silicon solar cell development 14 p0148 A77-21784
- Optimization of the sizing of a solar power plant  
in order to obtain a minimal kWh cost 14 p0154 A77-21845
- Fuel cells - A sleeper in the energy race  
14 p0170 A77-23647
- Status of silicon solar cell technology  
14 p0184 A77-26392
- Double-exposure collectors with mirrors for  
solar-heating systems  
[ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476
- Low-cost solar cells based on large-area  
unconventional silicon 15 p0258 A77-30730
- Optimal unit commitment --- electric power system  
operating mode for cost reduction 15 p0260 A77-30812
- Cut energy costs: A guide for buying and plant  
operation --- industrial energy saving techniques  
15 p0290 A77-34642
- Photovoltaic energy conversion using concentrated  
sunlight 16 p0402 A77-41516
- Thermal storage - It saves and saves and saves ---  
energy conservation 16 p0415 A77-42741
- The aircraft energy efficiency active controls  
technology program  
[AIAA 77-1076] 16 p0415 A77-42784
- Energy-efficient desiccant drying/dehumidification  
using solar or fossil fuel energy 16 p0449 A77-48750
- Feasibility study of an Integrated Energy/Utility  
System at the University of Florida 16 p0449 A77-48751
- Molten salt thermal energy storage for utility  
peaking loads 16 p0451 A77-48765
- A new family of hydrogen storage alloys based on  
the system nickel-mischmetal-calcium 16 p0457 A77-48817
- Considerations for using solar concentrators in  
photovoltaic systems 16 p0460 A77-48835
- Minimum cost sizing of solar heating systems  
16 p0480 A77-49010
- Design of low-cost aluminum heat exchangers for  
OTEC plant-ships --- Ocean Thermal Energy  
Conversion 16 p0485 A77-49046
- COSTS**
- Some cost, energy, environmental, and resource  
implications of synthetic fuels produced from  
coal for military aircraft  
[AD-A026667] 13 p0118 N77-14271
- COUETTE FLOW**
- A simple physical model of a magnetohydrodynamic  
generator 16 p0443 A77-48570
- COUNTER-ROTATING WHEELS**
- A multi-megajoule inertial-inductive energy  
storage system 15 p0299 A77-36292
- COUNTERFLOW**
- Investigation of counterflow shear effects in heat  
pipes  
[AIAA PAPER 77-749] 15 p0311 A77-37262
- COUPLING CIRCUITS**
- Element rating and coupling harmonics in a  
superconductive energy transfer system 16 p0411 A77-42164
- CRITICAL POINT**
- Investigation of the 'crisis' of heat and mass  
transfer in low-temperature wickless heat pipes  
15 p0316 A77-37927
- CROP GROWTH**
- Parametric studies of applications of controlled  
thermonuclear reactor fusion energy for food  
production 14 p0194 A77-27356
- Design, operation and economics of the energy  
plantation 15 p0315 A77-37667
- CROSS FLOW**
- Coupled electrical and fluid calculations in the  
cross plane in linear MHD generators 15 p0329 A77-39557
- CROSSED FIELDS**
- RF oscillations of a plasma in crossed E x B fields  
16 p0503 A77-50350
- CRUDE OIL**
- Energy and the oil industry 13 p0005 A77-11031
- World petroleum resources. IV - Probabilistic  
methods 13 p0012 A77-11342

- Off-shore oil scenarios - Method and results  
13 p0018 A77-12282
- Thermal alteration of young kerogen in relation to petroleum genesis  
13 p0053 A77-15044
- Combined solar and petroleum energy HVAC system for a commercial building in Dhahran --- Heating, Ventilating and Air Conditioning  
13 p0078 A77-19111
- Can new resources fill the energy gap  
14 p0166 A77-23380
- Utilization of disposed petroleum products and industrial wastes as fuels  
14 p0167 A77-23404
- Characteristics of synthetic crude from crude shale oil produced by in situ combustion retorting  
14 p0169 A77-23552
- Sulfur compounds in oils from the Western Canada Tar Belt  
14 p0169 A77-23553
- Production of synthetic crude from crude shale oil produced by in situ combustion retorting  
14 p0169 A77-23557
- Feasibility studies of a biochemical desulfurization method --- using microorganisms as agent from high sulfur containing petroleum  
14 p0170 A77-23562
- Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels  
14 p0177 A77-24852
- Fiat petrol engine performance with a mixture of basil extract with petrol  
14 p0179 A77-25196
- Tertiary oil production process  
14 p0196 A77-28520
- Unconventional petroleum and natural gas resources. II - Additional gas resources  
14 p0198 A77-28760
- The production of shale oil crude and its refining into military operational fuels  
15 p0292 A77-35155
- Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis  
15 p0298 A77-36254
- Economics of crude oil and natural gas - Cost of adding production  
15 p0300 A77-36327
- Preliminary economic analysis - Oil and power by COED-based coal conversion  
15 p0301 A77-36338
- Economics of synthetic gas production by the SEGAS process  
15 p0302 A77-36341
- North Slope oil and United States energy supply  
15 p0309 A77-36823
- The supply of the Federal Republic of Germany and Western Europe with energy, giving particular consideration to the oil and gas potential of the North Sea  
15 p0334 A77-39673
- Hydrocarbon deposits beyond the shelf edge of the oceans  
16 p0400 A77-40682
- Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source  
16 p0425 A77-44675
- Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea  
16 p0433 A77-47080
- The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study  
16 p0438 A77-47765
- Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation  
16 p0439 A77-48092
- A characterization of the sources of petroleum hydrocarbons in Lake Washington  
16 p0439 A77-48099
- National petroleum product supply and demand, 1976 - 1978  
13 p0084 A77-10224
- The long-run marginal costs of energy  
13 p0085 A77-10625
- Gasoline and distillate shortage situation: 1972-1976  
13 p0089 A77-10670
- The production and refining of crude oil into military fuels  
13 p0095 A77-11207
- Mandatory Canadian crude oil allocation regulations  
13 p0096 A77-11509
- Economic limits of OCS production wells  
13 p0096 A77-11515
- User's guide to petroleum industry survey data type  
13 p0098 A77-11544
- A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve  
13 p0105 A77-12500
- Crude oil supply alternatives for the Northern Tier states  
13 p0107 A77-12530
- Crude supply alternatives for the Northern Tier states. Volume 1: Executive summary  
13 p0107 A77-12531
- Crude supply alternatives for the Northern Tier states. Volume 2: Technical report  
13 p0107 A77-12532
- Petroleum market shares. Report on sales of propane to ultimate consumers, 1975  
13 p0108 A77-12540
- Tests of oil recovery devices in broken ice fields, phase 2  
13 p0110 A77-12572
- Temperature effects of crude oil in the upper intertidal zone  
13 p0110 A77-12581
- The exploration, development and production of Naval petroleum reserve number 4  
13 p0113 A77-13516
- Weekly petroleum statistics reports, 1974-1975  
13 p0124 A77-14608
- Ignition of flammable gases in crude-oil tankers as a result of metal fracture  
13 p0127 A77-15121
- Trends in refinery capacity and utilization: Petroleum refineries in the United States; foreign refinery exporting centers  
13 p0132 A77-15523
- Report to Congress on the economic impact of energy actions  
14 p0208 A77-16450
- Standards support and environmental impact statement. Volume 1: Proposed standards of performance for petroleum refinery sulfur recovery plants  
14 p0213 A77-17647
- Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
14 p0214 A77-18511
- Proceedings of a Symposium on Offshore Oil Potential and Related Land Use Impacts in the Central California Coastal Zone  
14 p0215 A77-18547
- Report to Congress on the economic impact of energy actions  
14 p0218 A77-18596
- Supply and demand of fuel sources for automobiles  
14 p0219 A77-19275
- Methanol engine: A transportation strategy for the post-petroleum era  
14 p0219 A77-19469
- Changing energy perspectives  
14 p0223 A77-19626
- The spatial characteristics of three Wyoming fuels  
14 p0233 A77-20612
- Petroleum market shares: A report on sales of distillate and residual fuel oil to ultimate consumers, 1975  
15 p0341 A77-22292
- Strategic petroleum reserve. Final environmental impact statement for Bayou Choctaw Salt Dome  
15 p0341 A77-22294
- Outer continental shelf oil and gas costs and production volume: Their impact on the nation's energy balance to 1990  
15 p0343 A77-22604
- Strategic petroleum reserve. Final environmental impact statement, volume 2  
15 p0349 A77-22676

- The phasing out of natural gas and oil for electric power generation, southwest power pool and Electric Reliability Council of Texas. Part 2: Technical and economic evaluation of various possible electric utility natural gas reduction programs, 1975 - 1990  
[PB-263505/0] 15 p0356 N77-23617
- State projections of industrial fuel needs  
[PB-263338/6] 15 p0356 N77-23620
- Research and development assessment on safety and pollution control for outer continental shelf operations  
[AD-A034727] 15 p0357 N77-23635
- Petroleum market shares - A report on sales of refined petroleum products, 1972 through 1975: aviation gasoline, jet fuels, middle distillate fuel oils, residual fuel oil, motor gasoline  
[PB-262726/3] 15 p0360 N77-24321
- Strategic petroleum reserve draft environmental impact statement for Central Rock Mine  
[PB-262390/8] 15 p0362 N77-24572
- Strategic petroleum reserve. Draft environmental impact statement for Ironton Mine  
[PB-262451/8] 15 p0362 N77-24573
- Strategic petroleum reserve. Bryan Mound salt dome  
[PB-262839/4] 15 p0362 N77-24579
- Strategic petroleum reserve. West Hackberry salt dome  
[PB-262508/5] 15 p0362 N77-24580
- Future oil supply to the northeast United States  
[BNL-50557] 15 p0369 N77-24729
- Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil  
[BNL-50538] 15 p0369 N77-24998
- Effects of alternative oil stockpiling programs on the US economy, 1976-1979  
[BNL-50541] 15 p0369 N77-24999
- Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks  
[PB-262789/1] 15 p0371 N77-25551
- XRF analysis of some regenerated catalysts  
[MRL-TN-388] 15 p0376 N77-26247
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 1  
[PB-264705/5] 15 p0383 N77-26677
- Environmental considerations of selected energy conserving manufacturing process options. Volume 4: Petroleum refining industry report  
[PB-264270/0] 15 p0384 N77-26681
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2  
[PB-264706/3] 15 p0385 N77-26693
- Energy industry investigation. Part 1: Joint ventures  
[GPO-72-530] 15 p0391 N77-27499
- Optimal drawdown strategy for strategic petroleum reserves  
[PB-265838/3] 16 p0512 N77-28569
- Petroleum situation reports 1974-1975  
[PB-265848/2] 16 p0513 N77-28573
- Project Independence Evaluation System (PIES) documentation. Volume 6: Methodology for improving the price sensitivity of the PIES oil and gas supply curves  
[PB-264069/6] 16 p0516 N77-28606
- Project Independence Evaluation System (PIES) documentation. Volume 7: Methodology for developing more complex investment and production profiles in the FEA oil and gas supply model  
[PB-264649/5] 16 p0516 N77-28607
- Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5] 16 p0516 N77-28610
- OPEC and the monopoly price of world oil (World Oil Project)  
[PB-265015/8] 16 p0518 N77-29001
- Project Independence Evaluation System (PIES) documentation. Volume 9: Allocation of exploratory activity to oil and natural gas in the FEA oil and gas supply model  
[PB-265772/4] 16 p0519 N77-29325
- Strategic petroleum reserve. Supplement final environmental impact statement. West Hackberry salt dome  
[PB-265756/3] 16 p0520 N77-29597
- Project Independence Evaluation System (PIES) documentation. Volume 8: Methodology for enabling the PIES oil and gas supply curves to respond to non-constant prices  
[PB-265086/9] 16 p0523 N77-29630
- Forecast of likely US energy supply/demand balances for 1985 and 2000, and implications for US energy policy  
[PB-266240/1] 16 p0523 N77-29633
- Analysis of energy projections for infrastructure development requirements  
[PB-266419/1] 16 p0524 N77-29640
- Continuation of the adjustment as a production incentive to the maximum weighted average first sale price for domestic crude oil (Energy Action no. 11)  
[PB-266841/6] 16 p0530 N77-30636
- Classification of oils by the application of pattern recognition techniques to infrared spectra  
[AD-A039387] 16 p0531 N77-30841
- FEA: Final reports on oil and gas resources, reserves, and productive capacities  
[GPO-80-748] 16 p0534 N77-31606
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California  
[UCRL-52180] 16 p0536 N77-31628
- Research and development in enhanced oil recovery. Part 1: Overview  
[ERDA-77-20/1] 16 p0537 N77-31637
- Research and development in enhanced oil recovery. Part 2: The program  
[ERDA-77-20/2] 16 p0538 N77-31650
- A user's guide to the MIT world energy demand data base. Part 2: Data index  
[PB-266830/9] 16 p0539 N77-31660
- Trends in world oil prices and production  
[PB-268411/6] 16 p0547 N77-32607
- Alternate petroleum based fuels for naval fleet usage: potential availability, cost, and system impact  
[AD-A041980] 16 p0551 N77-33372
- An economic model of new crude oil and natural gas supplies in the lower 48 states  
16 p0552 N77-33596
- CRUISING FLIGHT**  
Fuel consumption of civil jet transport aircraft  
13 p0062 A77-17234
- Best-range flight conditions for cruise-climb flight of a jet aircraft  
13 p0085 N77-10379
- CRYOGENIC EQUIPMENT**  
Thermal performance of the rotor of the MIT-EPRI J MVA superconducting alternator --- cryogenic cooling  
14 p0144 A77-21384
- Research and development of cryoalternators for large-electrical power systems  
14 p0190 A77-26536
- Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512
- Cryogenic instrumentation needs in the controlled thermonuclear research program  
[CONF-761007-1] 14 p0219 A77-19406
- Flexible cryogenic heat pipe development program  
[NASA-CR-152027] 16 p0520 N77-29451
- CRYOGENIC FLUID STORAGE**  
A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car  
15 p0279 A77-33378
- Cryogenic temperature control by means of energy storage materials --- for long space voyages  
[AIAA PAPER 77-763] 15 p0312 A77-37273
- ERDA's Chemical Energy Storage Program  
16 p0450 A77-48763
- An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports  
[NASA-CR-2699] 13 p0083 N77-10033
- A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car  
14 p0240 N77-21612
- On the storage of hydrogen by use of cryo-adsorbents  
14 p0245 N77-21646

## CRYOGENIC FLUIDS

- Flight results of a cryogenic cooler designed for  
Meteosat  
[IAP PAPER 76-210] 13 p0003 A77-10942
- Magnetic suspension densimeter for measurements on  
fluids of cryogenic interest 13 p0007 A77-11093
- Applications of cryogenic technology. Volume 8 ---  
Book 14 p0159 A77-22868
- Cryogenic fuel systems for motor vehicles 16 p0411 A77-42166
- Operation peculiarities of low temperature heat  
pipes with crimped capillary structure 13 p0119 N77-14380

## CRYOGENIC MAGNETS

- Cryogenic design for large superconductive energy  
storage magnets 16 p0411 A77-42156
- Temperature excursions during loss of magnet  
coolant accidents with thermalization of energy  
of large superconducting solenoids 16 p0411 A77-42160
- Applications of superconducting magnets to energy  
with particular emphasis on fusion power 16 p0411 A77-42161

## CRYOGENIC STORAGE

- On the storage of hydrogen by use of cryo-adsorbents 15 p0283 A77-33408

## CRYOGENICS

- Superconducting machinery for Naval ship propulsion 14 p0144 A77-21361
- Cryogenic Engineering Conference, Queen's  
University, Kingston, Ontario, Canada, July  
22-25, 1975, Proceedings 16 p0410 A77-42151
- Extended cryogenic performance of Lobar Wick heat  
pipe/radiator 13 p0119 N77-14379
- Investigations of nonsteady-state processes at  
cryogenic heat pipe operation --- filled with  
ammonia and Freon-22 13 p0119 N77-14384
- Cryogenic power transmission technology:  
Cryogenic dielectrics  
[ORNL-TM-5498] 15 p0341 A77-22297
- Cryogenic power transmission technology:  
Cryogenic dielectrics  
[ORNL-TM-5608] 15 p0389 N77-27249
- Thermal energy storage demonstration unit for  
Vuilleumier cryogenic cooler  
[AD-A040895] 16 p0553 N77-33613

## CRYSTAL DEFECTS

- The silicon ribbon solar cell 13 p0076 A77-19083

## CRYSTAL GROWTH

- The silicon ribbon solar cell 13 p0076 A77-19083
- Advanced technologies for photovoltaic cell  
fabrication 14 p0165 A77-23300
- Advanced vertical-junction silicon solar cells  
[AIAA PAPER 77-486] 14 p0172 A77-23906
- An isothermal etchback-regrowth method for  
high-efficiency Ga<sub>1-x</sub>Al<sub>x</sub>As-GaAs solar cells 15 p0257 A77-30372
- EPG growth of silicon ribbon for solar cells ---  
Edge-defined Film-fed crystal growth 16 p0485 A77-49051
- Development of low-cost silicon crystal growth  
techniques for terrestrial photovoltaic solar  
energy conversion 16 p0485 A77-49052
- Dip coating process: Silicon sheet growth  
development for the large-area silicon sheet  
task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513
- Silicon ribbon growth by a capillary action  
shaping technique  
[NASA-CR-149815] 14 p0227 N77-19898
- Silicon ribbon growth by a capillary action  
shaping technique  
[NASA-CR-149814] 14 p0227 N77-19899
- Epitaxial silicon technology for low-cost solar  
cells  
[PB-262396/5] 15 p0374 N77-25663
- Solar silicon via improved and expanded  
metallurgical silicon technology  
[NASA-CR-153415] 16 p0528 N77-30606

## CRYSTAL LATTICES

- Intermetallic compounds - Background and results  
of twenty years of research 13 p0014 A77-11600
- Some useful relationships between the physical and  
thermodynamic properties of metal hydrides 13 p0033 A77-12776

## CRYSTAL STRUCTURE

- Investigation on the crystalline structure of  
Cu<sub>x</sub>/S-CdS solar cells 14 p0149 A77-21803
- Low-cost solar cells based on large-area  
unconventional silicon 15 p0258 A77-30730
- Hydrogen atoms: Rare earth ions: Magnetic  
resonance studies on polycrystalline solids and  
surface systems relevant to catalysis and other  
energy-related research 13 p0117 N77-13798

## CRYSTALLIZATION

- Crystallization and vaporization studies on  
synthetic coal slag compositions 14 p0140 A77-21228
- Thermal energy storage with saturated aqueous  
solutions 16 p0493 A77-49111

## CURRENT DENSITY

- Performance characteristics of solid  
lithium-aluminum alloy electrodes 13 p0007 A77-11107
- Schottky solar cells on thin epitaxial silicon 13 p0047 A77-13509
- Air Force applications of lightweight  
superconducting machinery 14 p0144 A77-21360
- The influence of finite electrode segmentation on  
electrical performances of the Faraday HD  
generator 15 p0309 A77-36936
- Electrode phenomena in slagging MHD channels 15 p0330 A77-39561
- Finite length effects in linear induction machines  
with different iron contours 16 p0413 A77-42629
- Elimination of current concentration due to Hall  
effect by variable resistive electrodes 16 p0418 A77-43119

## CURRENT DISTRIBUTION

- Construction of two-dimensional steady-state  
solution of equations of a nonequilibrium  
magnetized plasma 13 p0065 A77-18130
- Two-dimensional analysis of end effects in  
diagonal type nonequilibrium plasma MHD generator 15 p0297 A77-36097
- Investigation of two-dimensional electric effects  
in a sectional MHD-channel 15 p0317 A77-37930
- Experimental investigation of multiple-loaded  
diagonal conducting wall generators 15 p0325 A77-39529
- The influence of the transverse current  
nonuniformity, caused by current leakages onto  
the insulating walls of the channel, on the  
local characteristics of a nonideal MHD generator 15 p0329 A77-39553
- Three dimensional current distribution in diagonal  
conducting wall channels 15 p0329 A77-39556
- Calculation of end effects in open-cycle MHD power  
generators 15 p0329 A77-39558
- On the construction of plane stationary solutions  
of equations for nonequilibrium magnetized plasma 16 p0420 A77-43705
- Calculation of a three-dimensional model for a  
conduction MHD machine with frame-type electrodes 16 p0425 A77-44694

## CURRENT REGULATORS

- Study of the auxiliaries for lead-acid battery  
systems for peaking power  
[CONS/2114-3] 16 p0556 N77-33634

## CURVATURE

- Solar concentration by curved-base Fresnel lenses  
[NASA-CR-2890] 16 p0524 N77-29946

## CYANO COMPOUNDS

- Investigation of acid-resistant electrocatalysts  
for fuel cells  
[NASA-TT-P-17367] 14 p0207 N77-16444

## CYCLIC HYDROCARBONS

Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal  
16 p0442 A77-48489

## CYCLIC LOADS

A 100-kW metal wind turbine blade basic data, loads and stress analysis  
[NASA-CR-134956] 14 p0236 N77-21467

## CYCLOTRONS

The U-240 cyclotron --- review of systems and processes  
13 p0046 A77-13151

## CYLINDRICAL BODIES

Experimental evaluation of a cylindrical parabolic solar collector  
[ASME PAPER 76-WA/HT-13] 14 p0186 A77-26473  
Structure of the electric field in the near-end space of a cylindrical electrode  
15 p0295 A77-35607  
Optical performance of fixed zenith-moving azimuth parabolic-cylindrical concentrator  
16 p0417 A77-42955  
A note of the economics of deep cylindrical mirror concentrating collectors  
16 p0502 A77-50218

## CYLINDRICAL SHELLS

Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions  
[ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508  
Numerical solution of heat conduction with phase change in cylindrical systems  
16 p0543 N77-32422

## CZOCHEWSKI METHOD

Advanced technologies for photovoltaic cell fabrication  
14 p0165 A77-23300  
Large area Czochralski silicon for solar cells  
16 p0486 A77-49054

## D

## DAMPING

Investigation of excitation control for wind-turbine generator stability  
[NASA-TM-73745] 16 p0535 N77-31614

## DATA ACQUISITION

Autonomous station for the acquisition and concentration of heliometric data  
13 p0072 A77-19046  
Development of a mobile solar testing and recording /STAR/ system --- trailer for domestic hot water system testing  
13 p0072 A77-19047  
A data acquisition, performance evaluation and monitoring system for solar heated/cooled residential dwellings  
[ASME PAPER 76-WA/SOL-13] 14 p0189 A77-26518  
Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data  
15 p0256 A77-30315  
Insolation data for solar energy conversion derived from satellite measurements of earth radiance  
16 p0471 A77-48930  
Site Data Collection System for solar energy applications  
16 p0480 A77-49014  
Space station systems analysis study. Part 1, volume 1: Executive study  
[NASA-CR-151102] 13 p0094 N77-11084  
Space station systems analysis study. Part 1, volume 2: Technical report  
[NASA-CR-151103] 13 p0094 N77-11085  
Process energy reliability requirements for selected industries  
[ORNL-TM-5428] 15 p0364 N77-24594  
Fuels and energy data: United States by states and census divisions, 1973  
[PB-262362/7] 15 p0367 N77-24636  
Electric utility solar energy activities, 1976 survey  
[EPRI-ER-321-SR] 16 p0515 N77-28598  
Project Independence Evaluation System (PIES) documentation. Volume 15: Standard data tables for PIES  
[PB-265195/8] 16 p0523 N77-29629

ENFORM: An energy information system

[BNWL-2195] 16 p0542 N77-32016

## DATA BASES

A thermochemical data bank for cycle analysis --- water decomposition for hydrogen production  
15 p0276 A77-33346  
Distribution of direct and total solar radiation availabilities for the USA  
16 p0471 A77-48926  
ERDA energy information data base: Magnetic tape description  
[TID-4581-R3] 13 p0102 N77-11695  
A thermochemical data bank for cycle analysis  
14 p0238 N77-21578  
Energy model data base program  
[BNL-21545] 14 p0250 N77-21687  
ERDA Interlaboratory Work for Data Exchange (IWGDE)  
[LBL-5329] 15 p0352 N77-22998  
Development and applications of spatial data resources in energy related assessment and planning  
[CONF-761017-1] 15 p0355 N77-23609  
Research leading to the production and early use of numeric data banks of material properties and system analyses  
[UCRL-50038-76-2] 15 p0364 N77-24601  
Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 1: Digest of detailed data base descriptions  
[UCID-17316-PT-1] 15 p0387 N77-27036  
Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 2: Detailed data base descriptions  
[UCID-17316-PT-2] 15 p0387 N77-27037  
A user's guide to the MIT world energy demand data base. Part 2: Data index  
[PB-266830/9] 16 p0539 N77-31660  
Energy Model Data Base (EMDB) using system 2000  
[BNL-21854] 16 p0541 N77-31814  
Accounting systems for energy conservation  
[LA-6569-MS] 16 p0557 N77-33646

## DATA CORRELATION

Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations --- for geothermal applications  
16 p0455 A77-48799  
Energy interrelationships. A handbook of tables and conversions factors for combining and comparing international energy data  
[PB-269034/5] 16 p0559 N77-33675

## DATA MANAGEMENT

The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report  
16 p0470 A77-48918  
Sources of energy data for Illinois  
[PB-262562/2] 15 p0350 N77-22686

## DATA PROCESSING

Processing of experimental data with the U-25 facility with the aid of a data measuring system --- MHD generator  
15 p0269 A77-32521  
Energy consumption measurement: Data needs for public policy  
[PB-266039/7] 16 p0517 N77-28619

## DATA REDUCTION

Microcomputer processor for monitoring of solar heated buildings  
16 p0481 A77-49015  
GDIST: A computer code for analysis of statistical distributions of physical data  
[PB-266762/4] 16 p0533 N77-31589

## DATA STORAGE

Directory of Federal energy data sources: Computer products and recurring publications  
[PB-254163/9] 13 p0093 N77-10941

## DATA SYSTEMS

A data acquisition, performance evaluation and monitoring system for solar heated/cooled residential dwellings  
[ASME PAPER 76-WA/SOL-13] 14 p0189 A77-26518

## DC 10 AIRCRAFT

Air New Zealand's methods of flying the DC-10  
[ATAA PAPER 77-1255] 16 p0421 A77-44343



## DECISION MAKING

- Decision making in the utilisation of the organic fraction of municipal wastes 15 p0299 A77-36272
- An application of the economic-environmental power dispatch --- decision approach for controlling air pollution emission from electric power generation 15 p0317 A77-38121
- Energy R&D modeling for budgetary decisions 15 p0319 A77-38218
- General Electric Company study for defining the number of residential and non-residential projects, National Solar Demonstration Program [COO-2683-76-7] 14 p0217 N77-18579
- Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618] 15 p0387 N77-27020
- Options for demonstrating the use of solar energy in California buildings [NASA-CR-154103] 16 p0513 N77-28582
- Land use, energy flow and policy making in society. SIMPAC handbook. A guide to the modeling of socio-economic phenomena [PB-267134/5] 16 p0530 N77-30637
- National Research Council Committee on Nuclear and Alternative Energy Systems [TID-27435] 16 p0538 N77-31655
- Public participation in energy related decision making, edited transcripts [PB-268781/2] 16 p0559 N77-33674
- DEEP SPACE NETWORK
- Status of Goldstone solar energy system study of the first Goldstone energy project 14 p0235 N77-21126
- DEFENSE INDUSTRY
- Technologies lead to conservation --- in munition plants 15 p0305 A77-36634
- DEFLECTION
- Use of calculated displaced shapes to define the reflected light pattern from a focused collector 16 p0473 A77-48948
- Horizontally mounted solar collector [NASA-CASE-MPS-23349-1] 16 p0529 N77-30613
- DEFOCUSING
- Radiant-vector distribution in the radiant field of a parabolocylindric concentrator 13 p0015 A77-11920
- DEGASSING
- Degasification and production of natural gas from an airshaft in the Pittsburgh coalbed [PB-258101/5] 14 p0210 N77-17555
- DEHUMIDIFICATION
- Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy 16 p0449 A77-48750
- Study of the application of solar chemical dehumidification system to wind tunnel facilities of NASA Lewis Research Center at Cleveland, Ohio [NASA-CR-149886] 14 p0227 N77-20116
- Application of chemical dehumidification system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana [NASA-CR-149888] 14 p0228 N77-20560
- DEHYDRATED FOOD
- Improved, inexpensive solar collectors for agricultural requirements 16 p0488 A77-49077
- Design and performance of an air collector for industrial crop dehydration 16 p0488 A77-49078
- DEHYDRATION
- Hydration-dehydration cycling of MgO-Mg(OH)<sub>2</sub> for application to solar heat storage systems [AI-ERDA-13178] 15 p0381 N77-26654
- DELIVERY
- Flight test development of a helicopter-towed surface delivery system 15 p0317 A77-38006
- DELPHI METHOD (FORECASTING)
- A two-stage forecasting methodology for developing a national energy policy 16 p0419 A77-43144
- Analysis of a Delphi study on hydrogen 14 p0246 N77-21649

## DEMAND (ECONOMICS)

- Load leveling with electric vehicles in the urban environment 13 p0024 A77-12701
- Energy demands: Modeling methods and techniques --- French book 15 p0264 A77-31595
- Overview of energy supply and demand 15 p0313 A77-37653
- International energy demand model - Twenty OECD country models 15 p0318 A77-38215
- International energy evaluation system 15 p0319 A77-38216
- A derived demand model of energy demand in the transportation sector 15 p0319 A77-38217
- National petroleum product supply and demand, 1976 - 1978 [PB-254969/9] 13 p0084 N77-10224
- A simulation analysis of US energy demand, supply, and prices [PB-254314/8] 13 p0090 N77-10680
- Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems [PB-253097/0] 13 p0099 N77-11556
- Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy [PB-255696/7] 13 p0100 N77-11561
- Explaining energy: A manual of non-style for the energy outsider who wants in [LBL-4458] 13 p0122 N77-14592
- IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125] 13 p0122 N77-14594
- Investment planning in the energy sector [LBL-4474] 13 p0125 N77-14948
- The intersectoral feedback model [PB-255859/1] 13 p0125 N77-14950
- Supply and demand of fuel sources for automobiles [UCRL-78066] 14 p0219 N77-19275
- Technical and environmental aspects of underground hydrogen storage 14 p0242 N77-21613
- Energy input-output modelling: Problems and prospects [PB-261925/2] 15 p0349 N77-22679
- State projections of industrial fuel needs [PB-263338/6] 15 p0356 N77-23620
- Incremental pricing of supplemental gas [PB-263689/2] 15 p0360 N77-24319
- Petroleum situation reports 1974-1975 [PB-265848/2] 16 p0513 N77-28573
- Project Independence Evaluation System (PIES) documentation. Volume 6: Methodology for improving the price sensitivity of the PIES oil and gas supply curves [PB-264069/6] 16 p0516 N77-28606
- DENSITOMETERS
- Magnetic suspension densimeter for measurements on fluids of cryogenic interest 13 p0007 A77-11093
- DENSITY DISTRIBUTION
- Stratified density solar collection ponds - Physical factors, results of previous investigations, and suggested experiments 16 p0418 A77-42964
- Solar flux density distributions on central tower receivers 16 p0484 A77-49038
- DENSITY MEASUREMENT
- Magnetic suspension densimeter for measurements on fluids of cryogenic interest 13 p0007 A77-11093
- DEPLETION
- Economics of depletable resources: Market forces and intertemporal bias [PB-255623/1] 13 p0111 N77-12930
- DEPOSITION
- Deposition of polycrystalline silicon solar cells 13 p0076 A77-19082
- Low energy production processes in manufacturing of silicon solar cells 16 p0486 A77-49055

## DESALINIZATION

## SUBJECT INDEX

## DESALINIZATION

Combined production of electrical power and desalinated water by nuclear power plants 15 p0255 A77-30100

Economics of a freeze desalting process using cold seawater effluent of a liquid natural gas plant [PB-259272/3] 14 p0234 N77-20656

**DESICCATORS**

Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy 16 p0449 A77-48750

**DESIGN ANALYSIS**

An analysis of electric vehicle mission, design, energy impact and cost 13 p0024 A77-12700

Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737

Wind-power generation on a large scale - A design idea 13 p0050 A77-14531

Termosole flat plate collectors 13 p0073 A77-19058

Cylindrical mirror collector field 13 p0074 A77-19071

High speed superconducting generator 14 p0144 A77-21383

Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator 14 p0144 A77-21386

A development of high efficiency electric mini-cars 14 p0201 A77-29470

Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell 15 p0258 A77-30721

Design of pointed solar concentrators 16 p0417 A77-42954

Optimum design of a single slope solar still in Riyadh, Saudi Arabia 16 p0417 A77-42956

Low-profile heliostat design for solar central receiver systems 16 p0422 A77-44480

Efficient, low cost, concentrating solar collectors 16 p0423 A77-44486

Morphological analysis as a design aid: An application to solar energy conversion processes --- French book 16 p0429 A77-46467

Design of a current technology electric vehicle 16 p0446 A77-48727

Solar collectors --- for heating and cooling of buildings 16 p0471 A77-48935

Design considerations for parabolic-cylindrical solar collectors 16 p0473 A77-48950

Optical and thermal design considerations for ideal light collectors 16 p0474 A77-48956

Design and construction of solar space heating and hot water supply systems for experimental multi-family housing 16 p0477 A77-48979

An analysis on optimal design of solar heating and cooling system for school 16 p0477 A77-48984

The Crain solar house - A case study in the architectural and engineering design process as applied to solar housing for public sale 16 p0496 A77-49140

Report on the design, construction, and marketing of two solar heated SPEC houses 16 p0496 A77-49141

Design phase utility analysis for gas turbine and combined cycle plants [PB-256665/1] 13 p0115 N77-13553

Solar cell array design handbook, volume 1 [NASA-CR-149364] 13 p0118 N77-14193

Solar cell array design handbook, volume 2 [NASA-CR-149365] 13 p0118 N77-14194

Central receiver solar thermal power system. Collector subsystem research experiments [SAN/1111-76/2] 14 p0225 N77-19649

Simple home heating system (what can be done now) [UCRL-77875] 14 p0232 N77-20598

Burner criteria for NO<sub>x</sub> control. Volume 1: Influence of burner variables on NO<sub>x</sub> in pulverized coal flames [PB-259911/6] 14 p0234 N77-20639

Design study of superconducting magnets for a combustion magnetohydrodynamic (MHD) generator [NASA-CR-135178] 14 p0234 N77-20886

Solar power satellite: Analysis of alternatives for transporting material to geosynchronous orbit [NASA-TM-X-74680] 14 p0235 N77-21136

Operations research investigations of satellite power stations [NASA-TM-X-73372] 14 p0236 N77-21547

Design considerations for a noncircular Tokamak demonstration plant [GA-A-14074] 15 p0351 N77-22968

Design considerations for capillary heat pipes at cryogenic temperatures [ORNL-MIT-28] 15 p0361 N77-24430

Experimental evaluation of a breadboard heat and product-water removal system for a space-power fuel cell designed with static water removal and evaporative cooling [NASA-TN-D-8485] 15 p0363 N77-24592

Evaluation of an all-glass, evacuated, tubular, non-focusing, non-tracking solar collector array [TID-27192] 15 p0364 N77-24600

Development of sodium-sulfur batteries for utility application [EPRI-EM-266] 15 p0391 N77-27510

MHD combustor design study --- coal-fired systems [TID-27144] 15 p0396 N77-27923

Design procedure for solar air heating systems [CONF-760842-14] 16 p0514 N77-28589

Optimal design of anisotropic (fiber-reinforced) flywheels [UCRL-52169] 16 p0522 N77-29616

Consideration of design and calibration of terrestrial reference solar cells 16 p0527 N77-30531

A non-aerospace application of plans: Preliminary structural design of wind turbine diffuser [BM-629] 16 p0534 N77-31604

Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles [CONF-760617-3] 16 p0535 N77-31618

Current fusion power plant design concepts [BNWL-2013] 16 p0549 N77-32894

JET project (design proposal) --- Tokamak experiment [EUR-5516] 16 p0549 N77-32914

Design definition of a mechanical capacitor [NASA-CR-152613] 16 p0552 N77-33603

Design and cost study of a zinc/nickel oxide battery for electric vehicle propulsion [ANL-K-76-3543-1] 16 p0556 N77-33635

Planning and design of additional East Mesa Geothermal Test Facilities. Phase 1B, Volume 2: Procurement package [SAN/1140-1/2-VOL-2] 16 p0558 N77-33657

Design guidelines for energy conserving systems [PB-268989/1] 16 p0559 N77-33670

**DESULFURIZING**

Low-sulfur coal obtained by chemical desulfurization followed by liquefaction 13 p0008 A77-11242

Operation of the Westinghouse Coal Gasification Process Development Unit 13 p0023 A77-12689

Catalytic coal liquefaction using synthesis gas 13 p0059 A77-16473

Desulfurization of flue gases with iron/III/oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions --- German book 13 p0080 A77-19184

Flue gas desulfurization experience 14 p0136 A77-20381

Feasibility studies of a biochemical desulfurization method --- using microorganisms as agent from high sulfur containing petroleum 14 p0170 A77-23562

Chemical cleaning of coal [ASME PAPER 76-WA/APC-2] 14 p0184 A77-26409

Applicability of the Meyers Process for desulfurization of U.S. coal /A survey of 35 coal mines/ 14 p0191 A77-27278

Fluidized bed combustion 14 p0192 A77-27290

Nonisothermal hydrogen-induced desulfurization of coal 15 p0287 A77-33544

# SUBJECT INDEX

# DIESEL FUELS

- Operation results of the desulfurization plant for a thermal power station 15 p0299 A77-36279
- Stack gas cleanup --- scrubber systems for high-sulfur coal 15 p0317 A77-37939
- Economic and energy considerations in MHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
- Dynamic characteristics of the desulfurization plant boiler draft system for power stations 15 p0338 A77-40201
- Desulfurization of coal by use of chemical comminution 16 p0418 A77-43009
- Comparative kinetics of high-temperature reaction between H<sub>2</sub>S and selected metal oxides 16 p0424 A77-44608
- Status of sulfur dioxide removal systems for the electric utility industry 16 p0504 A77-51144
- Flue gas desulfurization by fly ash 16 p0504 A77-51146
- Reductant gases for flue gas desulfurization systems [PB-254168/8] 13 p0C92 N77-10722
- Hot fuel gas desulfurization [PB-257036/4] 13 p0133 N77-15539
- Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges [PB-256691/7] 13 p0133 N77-15540
- Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3 [PB-268492/6] 16 p0548 N77-32615
- Overview and review of motor gasoline desulfurization, volume 1 [BERC/RI-76/17-VOL-1] 16 p0551 N77-33377
- Motor gasoline desulfurization study, volume 2 [BERC/RI-76/17-VOL-2] 16 p0551 N77-33378
- Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment [PB-269270/5] 16 p0561 N77-34058
- DETONATION WAVES**
- Explosively driven MHD generator power systems for pulse power applications 15 p0299 A77-36300
- DEUTERIUM**
- PACER - A practical fusion power concept 13 p0035 A77-12793
- Energy storage possibilities of atomic hydrogen 14 p0245 N77-21643
- DEUTERIUM PLASMA**
- Muon catalysed fusion for pellet ignition 13 p0012 A77-11468
- Studies of deuterium-fueled Tokamak reactors 16 p0435 A77-47357
- Advanced fuel fusion experimentation with Mignacells II and III - Orbit diagnostics and lifetime measurements 16 p0436 A77-47362
- Fusion products detection system in Mignacell II 16 p0436 A77-47363
- Power loss problems in EXTRAP coil systems [TRITA-PFU-77-02] 16 p0549 N77-32910
- DEUTERONS**
- Fusion products detection system in Mignacell II 16 p0436 A77-47363
- DEVELOPING NATIONS**
- Energy and the developing countries 13 p0006 A77-11043
- An energy center in Sri Lanka --- UN rural energy development program 13 p0021 A77-12669
- Formulation of energy policies - The case of West Africa 13 p0080 A77-19124
- The role of solar energy in developing nations - The perspectives in Mali 13 p0080 A77-19125
- Energy from bio-conversion for developing countries 15 p0270 A77-32592
- Implementation issues of wind energy --- cost analysis [ARAA 77-1025] 16 p0404 A77-41565
- Technical and socio-economic aspects of solar energy and rural development in developing countries 16 p0494 A77-49128
- Self sufficient energy integrated design and construction method for low cost-self help housing programs 16 p0495 A77-49137
- Role of renewable energy technologies in developing countries [BNL-22311] 16 p0556 N77-33638
- DIAMAGNETISM**
- Field-reversed mirror as a D-T power reactor [UCRL-78082] 15 p0351 N77-22967
- DIELECTRICS**
- On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices 16 p0488 A77-49073
- Cryogenic power transmission technology: Cryogenic dielectrics [ORNL-TM-5498] 15 p0341 N77-22297
- Cryogenic power transmission technology: Cryogenic dielectrics [ORNL-TM-5608] 15 p0389 N77-27249
- DIESEL ENGINES**
- Evolution of thermal traction - From the diesel engine to the gas turbine 13 p0004 A77-10976
- The performance of hydrogen-injected reciprocating engines 13 p0033 A77-12780
- The design and development of a hybrid-electric urban transit vehicle 14 p0159 A77-22876
- Volkswagen develops a diesel 15 p0290 A77-34630
- Biphase turbines for diesel bottoming --- waste heat recovery 16 p0449 A77-48755
- Development status - Binary Rankine cycle waste heat recovery system 16 p0459 A77-48828
- Combined diesel-organic Rankine-cycle power plant 16 p0459 A77-48830
- Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario 16 p0489 A77-49085
- Performance characteristics of a diesel engine using low- and medium-energy gases as a fuel supplement (fumigation) [NASA-TM-X-58188] 13 p0126 N77-14955
- Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases [PB-263523/3] 15 p0354 N77-23518
- Engine performance and fire-safety characteristics of water-containing diesel fuels [AD-A036011] 15 p0377 N77-26330
- Feasibility test on compounding the internal combustion engine for automotive vehicles, task 2 [COO-2690-1] 16 p0512 N77-28495
- An experimental study supported by a computer simulation in a prechamber CFR diesel engine leading to a modified cetane scale for rating low ignition quality fuels 16 p0525 N77-30259
- DIESEL FUELS**
- Volkswagen develops a diesel 15 p0290 A77-34630
- Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio 15 p0293 A77-35186
- Report of the Army Scientific Advisory Panel Ad Hoc Group on fire-safe fuels [AD-A023763] 13 p0095 N77-11208
- Fuels and lubricants --- an evaluation of military fuels and lubricants [AD-A032842] 15 p0359 N77-24314
- Thermal stability improvement of diesel fuels of isopropyltadecylamine [NASA-TT-P-17300] 15 p0388 N77-27442
- An experimental study supported by a computer simulation in a prechamber CFR diesel engine leading to a modified cetane scale for rating low ignition quality fuels 16 p0525 N77-30259

Chemical characterization of diesel exhaust  
particulates  
[PERC/RI-77/5] 16 p0540 A77-31671

**DIFFUSE RADIATION**  
A method for estimating hourly averages of diffuse  
and direct solar radiation under a layer of  
scattered clouds --- for solar collector design  
13 p0019 A77-12412  
Computation of solar radiation design curves  
13 p0072 A77-19049  
Concentration of scattered radiation --- by solar  
collectors 15 p0316 A77-37768  
Correlation equation for hourly diffuse radiation  
on a horizontal surface --- insolation on solar  
collectors 16 p0422 A77-44481  
Concentration of diffuse radiation --- by solar  
collectors 16 p0437 A77-47424  
Solar energy conversion with fluorescent collectors  
16 p0499 A77-49166

**DIFFUSERS**  
Potential application of radial splitter diffuser  
to shrouded wind turbines 14 p0199 A77-29071  
Design, construction, and testing of a compact,  
lightweight combustion driven MHD generator  
channel and diffuser 15 p0326 A77-39532  
Subsonic MHD-diffuser performance with high blockage  
15 p0331 A77-39567  
Fluid dynamics of diffuser augmented wind turbines  
16 p0467 A77-48899

**DIFFUSION**  
A non-aerospace application of plans: Preliminary  
structural design of wind turbine diffuser  
[RM-629] 16 p0534 A77-31604

**DIFFUSION WELDING**  
Development and testing of solar water-heating  
boilers manufactured by diffusion welding  
15 p0316 A77-37773  
Development and testing of solar water-heater  
boilers fabricated by diffusion welding  
16 p0437 A77-47429

**DIGESTING**  
Energy balance for anaerobic digestion  
14 p0138 A77-20999  
Packed bed digestion of solid wastes  
15 p0323 A77-39107  
Anaerobic sludge digestion - A potential energy  
source 16 p0439 A77-47970

**DIGITAL DATA**  
Results from circumsolar radiation measurements  
[LBL-5292] 15 p0382 A77-26657

**DIGITAL SIMULATION**  
Performance of an annular cylindrical solar  
collector 13 p0073 A77-19059  
Correlation equation for hourly diffuse radiation  
on a horizontal surface --- insolation on solar  
collectors 16 p0422 A77-44481  
Fusion products detection system in Migma cell II  
16 p0436 A77-47363  
A site sensitive solar collector evaluator  
16 p0473 A77-48947

**DIGITAL TECHNIQUES**  
A mathematical model for the digital computation  
of the hours of sunshine on an inclined plane  
14 p0166 A77-23382  
Modeling algorithms and their implementation on a  
digital computer for calculating the capacity of  
storage cells at wind-power and solar energy  
installations 15 p0316 A77-37775  
Construction and interpretation of a digital  
inertia image --- of Pisgah Crater and Latic  
Lake in Southern California 16 p0421 A77-44464  
Simulation algorithms and their realization by  
digital computer for calculation of wind- and  
solar-plant storage-service capacity 16 p0437 A77-47431

**DIODES**  
Thermic diode solar panels - A brief summary  
16 p0472 A77-48936

**DIRECT CURRENT**  
Pulsed energy conversion with a dc superconducting  
magnet 13 p0081 A77-19293  
Quasi-analog models of large systems of algebraic  
equations 16 p0433 A77-46959  
A theory of control for a class of electronic  
power processing systems: Energy-storage  
dc-to-dc converters  
[NASA-CR-152696] 15 p0344 A77-22614

**DIRECT POWER GENERATORS**  
Energy recovery from saline water by means of  
electrochemical cells 13 p0013 A77-11536  
A microwave energy converter with a reversing  
magnetic field 14 p0139 A77-21154  
A direct convertor based upon space charge effects  
14 p0184 A77-26160  
Terrestrial RTG designs featuring disc-shaped  
thermoelectric modules 16 p0462 A77-48856

**DISCONNECT DEVICES**  
Progress in switching technology for MBTS systems  
--- Magnetic Energy Transfer and Storage  
15 p0303 A77-36377

**DISKS**  
The disk geometry applied to open cycle MHD power  
generation - Experiments and theoretical  
considerations 15 p0325 A77-39531

**DISPLAY DEVICES**  
General Electric Company study for defining the  
number of residential and non-residential  
projects, National Solar Demonstration Program  
[COO-2683-76-7] 14 p0217 A77-18579  
Annual cycle energy system: Initial investigations  
[ORNL-TM-5525] 15 p0364 A77-24599  
Options for demonstrating the use of solar energy  
in California buildings  
[NASA-CR-154103] 16 p0513 A77-28582

**DISSOLVING**  
Mechanisms of coal particle dissolution  
13 p0059 A77-16475

**DISTILLATION**  
Petroleum market shares: A report on sales of  
distillate and residual fuel oil to ultimate  
consumers, 1975  
[PB-260565/7] 15 p0341 A77-22292

**DISTILLATION EQUIPMENT**  
Economic data for a 50,000 BPD Lurgi/Ruhrgas shale  
oil plant 15 p0300 A77-36331

**DISTRIBUTED PARAMETER SYSTEMS**  
Idealization of complex dynamic systems with  
examples involving electrical energy systems ---  
Russian book 16 p0434 A77-47331

**DISTRIBUTING**  
Comparative state-of-the-art assessment of gas  
supply modeling  
[EPRI-EA-201] 16 p0539 A77-31656

**DISTRIBUTION FUNCTIONS**  
Experience in using bimodal distribution curves to  
evaluate the reliability of systems supplying  
energy from renewable sources --- solar and wind  
systems for radio relay links 14 p0201 A77-29535

**DISULFIDES**  
Ambient temperature electric vehicle batteries  
based on lithium and titanium disulfide  
13 p0025 A77-12706  
Post-test analysis of Li/Pes2 compact cells  
16 p0448 A77-48739

**DIURNAL VARIATIONS**  
Selection of optimal pan color for solar water  
heater 13 p0078 A77-19104  
The advantages of sun tracking for planar silicon  
solar cells 14 p0181 A77-25904  
Study of an absorption solar refrigeration unit  
functioning on a round-the-clock basis  
15 p0316 A77-37772  
Investigation of solar absorption cooler for  
round-the-clock operation 16 p0437 A77-47428

## DIVIDERS

The pressure divider - A device for reducing  
gas-pipe-line pumping-energy requirements  
13 p0028 A77-12735

## DOMESTIC ENERGY

- The overccping of energy deficiencies with the aid  
of wind power  
13 p0008 A77-11174

Prospects for coal as a direct fuel and its  
potential through application of liquefaction  
and gasification technology  
13 p0008 A77-11241

The wind and its effect on the heating requirements  
13 p0009 A77-11266

Optimal thermal insulation as an  
investment-computational problem  
13 p0009 A77-11268

The assurance of the heat supply with respect to  
the primary energy use in the case of heating  
and air conditioning installations  
13 p0009 A77-11270

Energy: A radical redirection  
13 p0010 A77-11275

The utility of waters from the high-temperature  
areas in Iceland for space heating as determined  
by their chemical composition  
13 p0012 A77-11496

Energy in the household - Comparison of heating  
costs and prognosis concerning the consumption  
of energy until 1985  
13 p0015 A77-12059

The shaping of our needs in mineral raw materials  
and sources for meeting those needs ---  
Hungarian survey  
13 p0017 A77-12246

Developments in solar energy utilisation in the  
United Kingdom  
13 p0018 A77-12402

The solar water heater industry in South Florida -  
History and projections  
13 p0018 A77-12403

Thermal evaluation of a house using a  
movable-insulation heating and cooling system  
13 p0019 A77-12407

A method of testing for rating solar collectors  
based on thermal performance  
13 p0019 A77-12408

A forced circulation system for solar water heating  
13 p0019 A77-12413

Method of accounting for the ambiguity of initial  
information in the optimization of regional  
fuel/energy balance  
13 p0020 A77-12657

Modeling residential energy use  
13 p0027 A77-12726

Thermal energy storage applied to residential  
heating systems  
13 p0027 A77-12729

Space heating systems new and conventional in the  
Northwest with emphasis on alternate energy  
adaptations  
13 p0028 A77-12736

Geothermal studies in northern Nevada  
13 p0029 A77-12742

Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800

New concepts in solar photovoltaic electric power  
systems design  
13 p0038 A77-12817

An integrated photovoltaic/thermal High Intensity  
Solar Energy System /HISES/ concept for  
residential applications  
13 p0039 A77-12818

A summary of solar heating and cooling of  
buildings /SHACOB/ - Phase I demonstration  
planning studies  
13 p0039 A77-12821

Long term performance prediction of residential  
solar energy heating systems  
13 p0039 A77-12822

Experimental evaluation of the University of  
Florida solar powered ammonia/water absorption  
air conditioning system  
13 p0039 A77-12823

Detailed geographic analysis of residential energy  
consumption  
13 p0043 A77-12864

Siting of wind driven apparatus  
13 p0043 A77-12865

The consumer's cost of electricity from windmills  
13 p0043 A77-12866

Scientific-technological problems of the  
development of a fuel-energy complex in the USSR  
13 p0051 A77-14703

The potential for application of energy storage  
capacity on electric utility systems in the  
United States. I  
13 p0054 A77-15625

Energy and environmental considerations in  
extending heat pump applications  
13 p0062 A77-17058

Homeowner's guide to solar heating and cooling ---  
Book  
13 p0062 A77-17525

Contribution of the heat carried by solar  
radiation to the thermal balance of a room  
during the cold season and its effect on  
domestic fuel consumption  
13 p0063 A77-17558

A solar house with heat pipe collectors  
13 p0070 A77-18598

Development of a mobile solar testing and  
recording /STAR/ system --- trailer for domestic  
hot water system testing  
13 p0072 A77-19047

Survey of absorption refrigeration systems  
13 p0078 A77-19105

Solar-powered housing unit - Simulation of solar  
heating and cooling in Saudi Arabia  
13 p0078 A77-19110

Preliminary design data for a solar house in  
Riyadh, Saudi Arabia  
13 p0078 A77-19112

Heating a building by means of solar and  
electrical energy  
13 p0078 A77-19113

Application of solar heat to buildings in Austria  
13 p0079 A77-19114

Environmentally designed housing incorporating  
solar energy  
13 p0079 A77-19115

Lumiducts for Ecopolis --- urban solar light  
collection and transmission system  
13 p0079 A77-19116

Water pumping - A practical application of solar  
energy  
13 p0079 A77-19117

Wind power --- wind-powered plant design  
14 p0136 A77-20042

The energy crisis today - A perspective  
14 p0137 A77-20390

Computer van programs - An assessment  
14 p0137 A77-20391

The current status of the U.S. Photovoltaic  
Conversion Program  
14 p0147 A77-21782

Photovoltaic test and demonstration project ---  
residential energy program  
14 p0153 A77-21838

Solar space heating and cooling with Bi-heat  
source heat pump and hot water supply system  
14 p0158 A77-22643

Preliminary performance of CSU Solar House I  
heating and cooling system  
14 p0158 A77-22644

Impacts of future use of electric cars in US cities  
14 p0161 A77-22902

Raw materials for energy generation in Canada  
14 p0165 A77-23315

Clean fuels from biomass  
14 p0167 A77-23390

The ASHRAE monograph on applications of solar  
energy for heating and cooling buildings  
14 p0167 A77-23441

Solar energy retrofit for existing buildings  
14 p0168 A77-23444

The national laser-fusion program  
14 p0168 A77-23502

A progress report on the national program for  
solar heating and cooling  
14 p0170 A77-23656

Gasification of Rhenish brown coal as mined  
14 p0175 A77-24213

A methodological survey of energy modeling  
14 p0177 A77-24592

Prospects for fusion energy  
14 p0178 A77-24928

- Energy from the wind 14 p0179 A77-25575
- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House 14 p0182 A77-26058
- Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078
- The high potential of wind as an energy source 14 p0183 A77-26084
- Coal gasifier projects gather momentum 14 p0184 A77-26290
- An economic evaluation of small-scale wind powered electric generation systems [ASME PAPER 76-WA/ENER-1] 14 p0185 A77-26430
- Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors [ASME PAPER 76-WA/FU-10] 14 p0185 A77-26457
- Performance of flat-plate collectors with planar reflectors [ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478
- The New Mexico Department of Agriculture solar heated and cooled building [ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515
- Design and simulation studies for the Shenandoah Community Center large-scale solar cooling demonstration [ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520
- Solar heating and cooling and energy conservation potentials for commercial buildings [ASME PAPER 76-WA/SOL-17] 14 p0189 A77-26522
- A preliminary assessment of solar energy technology [ASME PAPER 76-WA/TS-1] 14 p0190 A77-26531
- Political and economic justification for immediate realization of a syn fuels industry 14 p0191 A77-27276
- On enthalpy management in small buildings --- energy storage and conservation in residential structures 14 p0194 A77-27354
- The MBB solar houses - Design, operation, and experience 14 p0197 A77-28678
- Possibilities and economic limits concerning solar heating 14 p0197 A77-28679
- Physical, chemical, and technological principles of latent heat storage 14 p0203 A77-29571
- Development of solar tower program in the United States 14 p0204 A77-29591
- Design and performance studies on a solar room heater 15 p0255 A77-30314
- Dimensioning of the solar heating system in the Zero Energy House in Denmark 15 p0256 A77-30319
- Lighting with sunlight using sun tracking concentrators 15 p0260 A77-31245
- The law for saving energy and its significance for energy politics 15 p0261 A77-31372
- Energy savings by application of knowledge of building physics. I - Wall permeability and its significance for the atmospheric conditions in the building interior, the design and the thermal characteristics of windows, problems concerning the permeability of the joints 15 p0261 A77-31373
- Economy of tap water heating in summer by means of solar energy 15 p0261 A77-31374
- Optimal tap water heating 15 p0261 A77-31375
- Thermal energy storage --- in building elements, water and rock beds 15 p0264 A77-31698
- Cooling with solar energy 15 p0268 A77-32401
- Technical prospects for commercial and residential distribution and utilization of hydrogen 15 p0283 A77-33404
- ERDA's hydrogen programs 15 p0284 A77-33412
- A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives 15 p0285 A77-33421
- The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496
- Summary of 1976 geothermal drilling - Western United States 15 p0286 A77-33522
- Sun power: An introduction to the applications of solar energy --- Book 15 p0288 A77-33967
- The University of Florida solar house 15 p0294 A77-35317
- Solar energy prospects grow for US southwest 15 p0297 A77-36049
- A comparison of residential and commercial energy use in the United States and Sweden 15 p0297 A77-36114
- Historical patterns of residential and commercial energy uses 15 p0298 A77-36244
- Economics of crude oil and natural gas - Cost of adding production 15 p0300 A77-36327
- 80 per cent of the heat requirements satisfied by the sun --- in solar house 15 p0304 A77-36450
- Energy research overview - Alternatives for energy development [AAS 75-280] 15 p0304 A77-36555
- Active solar-heating systems for houses 15 p0306 A77-36724
- Toward establishing a national energy policy 15 p0307 A77-36767
- Residential energy use alternatives to the year 2000 15 p0307 A77-36768
- Economic benefits of energy conservation 15 p0307 A77-36797
- The economics of solar home heating systems for the southwest region 15 p0309 A77-36824
- Overview of energy supply and demand 15 p0313 A77-37653
- Solar heating in residential houses in Uzbekistan 15 p0316 A77-37774
- Future trends in electrical energy generation economics in the United States 15 p0317 A77-37960
- A United States energy model economically driven by a global growth simulation 15 p0319 A77-38220
- The Energy Supply Planning Model - A working tool for regional analysis of alternative national energy policies 15 p0319 A77-38221
- A solar heating system simulation model 15 p0319 A77-38222
- Comparative energy policies of France, England, and Germany. II - Electricity and nuclear energy 15 p0324 A77-39505
- Ultimate consumption of fuel and energy in the nonindustrial sector 15 p0334 A77-39668
- Geothermal heat - instead of electrically powered compression - proposed for cooling a small residence or office building 15 p0335 A77-39818
- The Philips energy-experimentation house - Results and experience 15 p0336 A77-39982
- The solar system in the solar house Dornier/RWE in Essen 15 p0336 A77-39983
- The BBC solar house - Design and experience 15 p0336 A77-39984
- The MBB solar houses - Design, operation, and experience 15 p0336 A77-39985
- Solar energy as contribution to the energy budget - Problems of storage 15 p0336 A77-39986
- Heat pumps in solar installations 15 p0337 A77-39987
- Calculation and optimization of solar-energy systems which provide hot water 15 p0337 A77-39988

- The BBC Sclarwatt system --- for domestic hot water supply 15 p0337 A77-39989
- Possibilities and limitations concerning the economy of solar heating systems 15 p0337 A77-39990
- Alternatives to oil and gas through energy management [AIAA 77-1006] 16 p0403 A77-41553
- Compressed air energy storage [AIAA 77-1008] 16 p0403 A77-41555
- The annual cycle energy system - A hybrid heat pump cycle 16 p0408 A77-41823
- Solar energy - Promises and pitfalls [AIAA PAPER 77-1022] 16 p0409 A77-41856
- The 'wind-wall' - An integrated wind/solar system 16 p0410 A77-42075
- Putting alternative sources of energy into prospective 16 p0414 A77-42633
- Future energy options, ethics and a case for conservation 16 p0415 A77-42860
- Prefabricated houses with an indoor swimming pool heated by a heat pump 16 p0421 A77-44448
- Domestic hot water and solar energy in Ireland 16 p0430 A77-46608
- Residential solar heating in Uzbekistan 16 p0437 A77-47430
- Solar energy installation for the project 'Motto di Lena' in Minusio/Tessin 16 p0441 A77-48257
- Energy savings obtained by applying the findings of construction physics. II 16 p0441 A77-48259
- Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743
- Development of the High Seasonal Performance Factor Gas Heat Pump --- for space heating 16 p0448 A77-48744
- Safety considerations for high temperature thermal energy storage in fluclide salts 16 p0451 A77-48768
- Photovoltaic applications for the National Park Service 16 p0460 A77-48837
- Stimulation of the solar industry by way of the Federal Buildings Program 16 p0462 A77-48850
- Practicability study of Stirling total energy systems 16 p0465 A77-48882
- Design and operational evaluation of a 25 kW wind turbine generator for residential heating applications 16 p0468 A77-48901
- Solar residential demonstration program 16 p0469 A77-48914
- The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report 16 p0470 A77-48918
- Prospectus on commercialization of solar heating and cooling systems 16 p0470 A77-48920
- ERDA/USDA Agricultural Solar Thermal Energy Program 16 p0470 A77-48921
- Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923
- A solar home for low income families 16 p0476 A77-48970
- Design and construction of a residential solar heating system at Fermilab 16 p0476 A77-48977
- Climate based solar house design - Hot and humid Charleston, S.C. 16 p0478 A77-48991
- Residential solar heating retrofit in the urban environment 16 p0478 A77-48992
- A status report on the USAFA solar energy program 16 p0478 A77-48993
- Energy conservation through residential solar retrofit 16 p0479 A77-48994
- Solar retrofit of a home in Granton, Ontario 16 p0479 A77-48995
- Project Sunshower - San Jose State University dormitory retrofit to solar-assisted water heating 16 p0479 A77-48996
- A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families 16 p0479 A77-48998
- System performance of first residential solar installation in Charlottesville, Virginia, U.S.A. - Retrofitted indoor swimming pool 16 p0479 A77-48999
- Climatological constraints on the development of solar energy in Canada 16 p0480 A77-49005
- An averaging technique for predicting the performance of a solar energy collector system 16 p0480 A77-49008
- A structural design process for solar energy systems 16 p0480 A77-49012
- Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- Effect of solar home heating on electric utilities 16 p0494 A77-49123
- Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126
- Solar high technology and architecture 16 p0495 A77-49129
- Some institutional problems of residential solar heating 16 p0495 A77-49130
- The updated homesteader 16 p0495 A77-49136
- Residential energy use alternatives to the year 2000 [CONF-760648-1] 14 p0223 A77-19625
- Technical review and analysis of the total utility demonstration plant design and operational concept [AD-A037016] 15 p0398 A77-28040
- DOMESTIC SATELLITE COMMUNICATIONS SYSTEMS**
- Satellite communications for off-shore oil operations using WESTAR 13 p0053 A77-15130
- Anik B, the new Canadian domestic satellite 16 p0499 A77-49249
- DRAFT (GAS FLOW)**
- Dynamic characteristics of the desulfurization plant boiler draft system for power stations 15 p0338 A77-40201
- The solar fan - Solar induced draft air conditioning system 16 p0478 A77-48988
- DRAG MEASUREMENT**
- Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 KW wind turbine tower [NASA-TN-X-73548] 13 p0114 A77-13534
- DRAG REDUCTION**
- Wind tunnel investigation of devices to reduce bus aerodynamic drag [AIAA PAPER 77-307] 13 p0066 A77-18232
- Fuel conservation through airplane maintenance 16 p0427 A77-45925
- Reduced drag, paraboloid type, solar energy collectors 16 p0473 A77-48951
- Drag reduction in cocurrent horizontal natural gas-hexane pipe flow 16 p0519 A77-29441
- An overview of concepts for aircraft drag reductions 16 p0543 A77-32092
- DRAINAGE**
- Acid mine drainage - The problem and the solution 16 p0425 A77-45125
- DRILLING**
- Geothermal energy development 13 p0064 A77-17801
- Economics of crude oil and natural gas - Cost of adding production 15 p0300 A77-36327
- Evaluation of the Lawrence Livermore Laboratory in-situ coal gasification concept 15 p0300 A77-36332

# DRILLS

# SUBJECT INDEX

Drilling for energy resources  
 [PB-259206/1] 14 p0235 N77-20972  
 The Hawaii geothermal project, initial phase 2  
 progress report 15 p0355 N77-23594  
 [PB-263120/8]  
 Thermal gradient and heat flow drilling, volume 5  
 [PB-268422/3] 16 p0544 N77-32577

**DRILLS**  
 New turbodrill for geothermal drilling 16 p0456 A77-48810  
 Thermocorer for geothermal applications 16 p0456 A77-48811

**DROP TRANSFER**  
 Evaporation of solution droplets in a  
 high-temperature medium --- potassium carbonate  
 MHD flow properties 13 p0046 A77-13254  
 Evaporation of a drop of solution in a  
 high-temperature medium --- potassium carbonate  
 MHD flow properties 15 p0263 A77-31534

**DROPS (LIQUIDS)**  
 Infrared extinction spectra of some common liquid  
 aerosols 15 p0290 A77-34561  
 Ignition of droplets of liquid fuels solvent  
 extracted from coal 16 p0508 A77-51588

**DRY CELLS**  
 Review of electrode designs and fabrication  
 techniques for lithium-aluminum/iron sulfide cells 13 p0025 A77-12713  
 Development status of lithium-silicon-iron sulfide  
 load-leveling batteries 13 p0026 A77-12714

**DRY HEAT**  
 LASL hot dry rock geothermal project  
 [LA-6525-PB] 15 p0372 N77-25639

**DRYING**  
 Drying of refuse-derived fuel for energy recovery  
 from municipal solid waste 14 p0182 A77-26071  
 Research on the application of solar energy to the  
 food drying industry [PB-267210/3] 16 p0530 N77-30635

**DRYING APPARATUS**  
 Grain drying in stationary bins with solar heated  
 air 13 p0019 A77-12411

**DUCTED BODIES**  
 Lumiducts for Ecopolis --- urban solar light  
 collection and transmission system 13 p0079 A77-19116

**DUCTED FLOW**  
 A theory and experimental investigation of ducted  
 wind turbines 16 p0410 A77-42072

**DURABILITY**  
 Durability testing at one atmosphere of advanced  
 catalysts and catalyst supports for automotive  
 gas turbine engine combustors, part 1  
 [NASA-CR-135132] 16 p0520 N77-29519

**DUST**  
 Particle size distributions of dusts in the flue  
 gas of power plants and in atmospheric air 15 p0265 A77-31889

**DYES**  
 Photocell using covalently-bound dyes on  
 semiconductor surfaces 16 p0412 A77-42412  
 Photon trapping and energy transfer in  
 multiple-dye plastic matrices - An efficient  
 solar-energy concentrator 16 p0418 A77-43070

**DYNAMIC CHARACTERISTICS**  
 Linear model of a dissipative PWM shunt regulator  
 --- Pulse Width Modulation 13 p0080 A77-19172  
 Dynamic characteristics of the desulfurization  
 plant boiler draft system for power stations 15 p0338 A77-40201  
 On the nature of fluctuations in an open cycle  
 magnetohydrodynamic generator 13 p0117 N77-13841  
 Transfer function analysis of heat pipes 13 p0119 N77-14385  
 Coupled dynamics analysis of wind  
 energy systems [NASA-CR-135152] 14 p0228 N77-20558

Dynamics systems analysis of the relation between  
 energy and the economy [BNL-21667] 14 p0235 N77-20931  
 Dynamic tests of hydrogen-powered IC engines ---  
 for mass transit vehicles 14 p0244 N77-21633

**DYNAMIC CONTROL**  
 Dynamic modeling and control of  
 magnetohydrodynamic/steam electrical power  
 generating plants 15 p0332 A77-39572

**DYNAMIC LOADS**  
 Dynamic blade loading in the ERDA/NASA 100 kW and  
 200 kW wind turbines [NASA-TM-73711] 16 p0528 N77-30599

**DYNAMIC MODELS**  
 A system model for the investigation of  
 alternative energy strategies --- German book 13 p0080 A77-19181  
 A methodological survey of energy modeling 14 p0177 A77-24592  
 Experimental solar heating-cooling system model  
 tests of a full-scale building system 15 p0319 A77-38224  
 Idealization of complex dynamic systems with  
 examples involving electrical energy systems ---  
 Russian book 16 p0434 A77-47331  
 Dynamic modeling of fluidized bed boilers for  
 control system design 16 p0454 A77-48792  
 Dynamic modeling and sensitivity analysis of solar  
 thermal energy conversion systems 16 p0461 A77-48845  
 Payback of solar systems --- cost effectiveness  
 evaluation by dynamic economical model 16 p0493 A77-49115  
 An estimate of the interaction of a limited array  
 of windmills --- feasibility of windpower group  
 station for proposed site [DN-16] 13 p0114 N77-13539

**DYNAMIC PROGRAMMING**  
 Study to assess the application of shadow pricing  
 techniques to national energy resource planning  
 [BNL-50537] 15 p0369 N77-24997

**DYNAMIC STRUCTURAL ANALYSIS**  
 Two general methods for the unsteady aerodynamic  
 analysis of horizontal-axis windmills 16 p0467 A77-48896  
 Some dynamic problems of rotating windmill systems  
 13 p0084 A77-10271  
 A 100-kW wind turbine blade dynamics analysis,  
 weight-balance, and structural test results  
 [NASA-CR-134957] 14 p0236 N77-21468

**DYNAMIC TESTS**  
 Dynamic tests of hydrogen-powered IC engines  
 15 p0282 A77-33395

# E

**EARTH CORE**  
 The flow of heat from the earth's interior 16 p0408 A77-41800

**EARTH CRUST**  
 The question of the utilization of geothermal  
 energy in dry rocks /dry walls/ 15 p0303 A77-36348  
 Geothermal significance of magnetotelluric  
 sounding in the eastern Snake River  
 Plain-Yellowstone region 15 p0310 A77-36999  
 Cross structural plan of the earth's crust and the  
 problem of the manifestation of its plutonic  
 elements on the surface (Tian-Shan and Turan  
 plate as examples) [NASA-TT-P-16938] 13 p0117 N77-13590

**EARTH ENVIRONMENT**  
 Environmental impact of space manufacturing  
 [AIAA PAPER 77-539] 15 p0266 A77-32062

**EARTH ORBITS**  
 Power satellite construction location considerations  
 --- orbital assembly for solar energy conversion 16 p0463 A77-48869

**EARTH PLANETARY STRUCTURE**  
 The flow of heat from the earth's interior 16 p0408 A77-41800

**EARTH RESOURCES**  
 The energy problem and the earth's fuel situation 13 p0004 A77-11027



# SUBJECT INDEX

# ECONOMIC ANALYSIS

Energy analysis in modelling 13 p0007 A77-11047

A word on worldwide petroleum resources 13 p0011 A77-11336

Concerning world oil resources. II - Statistical logistic models /King Hubbert's models/ 13 p0011 A77-11339

World oil resources. III - The geological analogy method 13 p0012 A77-11341

World petroleum resources. IV - Probabilistic methods 13 p0012 A77-11342

The world's oil resources. V - Recovery rates 13 p0012 A77-11343

Synthetic fuels - Prices, prospects, and prior art 13 p0017 A77-12236

Energy: Conversion and utilization --- Book 13 p0052 A77-14957

Geothermal sources and their utilization 13 p0055 A77-15803

Perspectives for world energy production 13 p0056 A77-16202

More about geothermal steam or the hottest energy prospect ever --- Book 14 p0191 A77-26925

Net energy analyses for liquid-dominated and vapor-dominated hydrothermal energy-resource developments 14 p0194 A77-27351

World coal resources and the role of coal in turn-of-the-century energy economy 14 p0198 A77-28758

Unconventional petroleum and natural gas resources. II - Additional gas resources 14 p0198 A77-28760

Energy and natural resources 15 p0263 A77-31574

Space: A resource for earth - An AIAA review --- Book 15 p0269 A77-32440

'Free' and renewable energy sources 15 p0289 A77-34306

Overview of energy supply and demand 15 p0313 A77-37653

Wastes and biomass as energy resources - An overview 15 p0313 A77-37654

Research to anticipate environmental impacts of changing resource usage [PB-256293/2] 13 p0101 N77-11602

An application of ERTS technology to the evaluation of coal strip mining and reclamation in the northern Great Plains [NASA-CR-149208] 13 p0104 N77-12486

The spatial characteristics of three Wyoming fuels [AD-A030873] 14 p0233 N77-20612

A process for coastal resource management and impact assessment [PB-264811/1] 15 p0376 N77-26004

Long-term natural resource availability: Environmental and political implications in the United States [PB-265762/5] 16 p0511 N77-28327

Polar energy resources potential [GPO-76-187] 16 p0520 N77-29605

Space technology in the discovery and development of mineral and energy resources 16 p0526 N77-30289

A screening for potentially critical materials for the National stockpile [PB-267214/5] 16 p0533 N77-31595

Energy Technologies for the West: Geothermal; Energy from the earth [TID-27431] 16 p0537 N77-31642

Role of renewable energy technologies in developing countries [BNL-22311] 16 p0556 N77-33638

**EARTH RESOURCES PROGRAM**

Acid mine drainage - The problem and the solution 16 p0425 A77-45125

Spinoff 1977: An annual report [NASA-TM-74908] 16 p0561 N77-34049

**EARTH RESOURCES SURVEY AIRCRAFT**

Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories 16 p0433 A77-47201

**EARTH SURFACE**

Determination of average ground reflectivity for solar collectors 14 p0181 A77-25903

The flow of heat from the earth's interior 16 p0408 A77-41800

Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories 16 p0433 A77-47201

Cross structural plan of the earth's crust and the problem of the manifestation of its plutonic elements on the surface (Tyan-Shan and Turan plate as examples) [NASA-TT-F-16938] 13 p0117 N77-13590

**EARTH TIDES**

Predicting changes in tidal regime - The open boundary problem --- for tidepower generation 14 p0199 A77-29076

**EARTHQUAKES**

Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas, Utah, volume 4 [PB-268421/5] 16 p0544 N77-32574

**ECLIPSES**

Preliminary report on the CTS transient event counter performance through the 1976 spring eclipse season [NASA-TM-X-73487] 13 p0083 N77-10116

**ECOLOGY**

Combined studies of the sun and isotope ecology 15 p0271 A77-32868

Can we control the carbon dioxide in the atmosphere 15 p0322 A77-38674

Utility views of MHD power generation [AIAA 77-1010] 16 p0403 A77-41557

Critical areas: Satellite power systems concepts [NASA-TM-X-74694] 15 p0362 N77-24585

Ecological review of hydroelectric reservoirs in Puerto Rico [CEER-1] 16 p0540 N77-31673

Interagency energy/environment research and development program: Status report 3 [PB-267443/0] 16 p0558 N77-33662

**ECONOMIC ANALYSIS**

Principles of energy analysis 13 p0007 A77-11045

Energy analysis in modelling 13 p0007 A77-11047

Higher electric power use reduces energy consumption for same gross national product 13 p0011 A77-11334

The mysteries of nuclear programs --- energy conversion efficiency 13 p0011 A77-11337

The economics of coal supply - The state of the art 13 p0013 A77-11523

Optimization criteria for solar and wind power systems 13 p0015 A77-11923

The significance of coal in the future energy picture 13 p0018 A77-12247

Comparative economics for the Arthur D. Little extractive coking process --- coal liquefaction 13 p0022 A77-12684

Modeling residential energy use 13 p0027 A77-12726

An evaluation of the use of metal hydrides for solar thermal energy storage 13 p0028 A77-12739

The economic generation of electricity from moderate temperature geothermal resources 13 p0030 A77-12749

Preliminary analysis of electric generation utilizing geopressured geothermal fluids 13 p0030 A77-12752

The potential national benefits of geothermal electrical energy production from hydrothermal resources in the West 13 p0031 A77-12760

An engineering feasibility study of using low temperature geothermal sources in Colorado 13 p0031 A77-12762

Benefits of hydrogen production research 13 p0032 A77-12768

Economic optimization of the energy transport component of a large distributed solar power plant 13 p0037 A77-12807

- An integrated photovoltaic/thermal High Intensity Solar Energy System /HISES/ concept for residential applications 13 p0039 A77-12818
- Wind driven field modulated generator systems 13 p0044 A77-12869
- Is nuclear energy economically viable --- competition with coal 13 p0045 A77-12933
- Energy consumption in various modes of transportation 13 p0050 A77-14561
- Evolution of the concept of the automobile from the standpoint of saving energy 13 p0051 A77-14562
- The economic viability of pursuing a space power system concept [AIAA PAPER 77-353] 13 p0066 A77-18258
- Evaluating revenue sources for public transit - A new frontier for environmental planners 13 p0070 A77-18723
- The silicon ribbon solar cell 13 p0076 A77-19083
- Formulation of energy policies - The case of West Africa 13 p0080 A77-19124
- The seat belt light is on --- airline industry economic assessment and forecasts 13 p0080 A77-19175
- All-round technical and economic investigations of open-cycle industrial MHD generator channels and superconducting magnet systems 14 p0142 A77-21266
- The economic collection and efficient utilization of solar energy 14 p0147 A77-21778
- Problems relating to heat storage --- at solar thermal power plant 14 p0152 A77-21826
- How six coal gasification processes compare economically 14 p0165 A77-23308
- The dilemma of future electric power demand 14 p0167 A77-23391
- Possible applications of geothermal energy in France 14 p0175 A77-24208
- Solar retrofit in a large institutional building - An economic analysis 14 p0176 A77-24500
- A methodological survey of energy modeling 14 p0177 A77-24592
- Simulation and cost optimization of solar heating of buildings in adverse solar regions 14 p0180 A77-25897
- An economic evaluation of small-scale wind powered electric generation systems [ASME PAPER 76-WA/ENER-1] 14 p0185 A77-26430
- Solar heating thermal storage feasibility [ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483
- A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- An economic analysis of thermic diode solar panels [ASME PAPER 76-WA/SOL-7] 14 p0188 A77-26512
- Political and economic justification for immediate realization of a syn fuels industry 14 p0191 A77-27276
- Parametric studies of applications of controlled thermonuclear reactor fusion energy for food production 14 p0194 A77-27356
- Geothermal energy development 14 p0194 A77-27881
- Current problems in energy development and energy sciences 14 p0194 A77-27882
- The case for alternative energy sources 15 p0262 A77-31469
- Energy and natural resources 15 p0263 A77-31574
- Gas economy - Gas technology --- energy supply and utilization 15 p0263 A77-31576
- Energy demands: Modeling methods and techniques --- French book 15 p0264 A77-31595
- Industry can save energy without stunting its growth 15 p0267 A77-32209
- Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593
- Economics of nuclear-electrolytic hydrogen 15 p0285 A77-33419
- A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives 15 p0285 A77-33421
- The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496
- Studies on the energy system of Hokkaido. I - First attempt: Model-I. II - Various data and their basis. III - Simulations by Model-I 15 p0287 A77-33526
- Economics of alternative energy sources 15 p0288 A77-33755
- A parametric analysis of the structure of international energy consumption 15 p0298 A77-36242
- Historical patterns of residential and commercial energy uses 15 p0298 A77-36244
- A simple model for solar energy economics in the U.K 15 p0298 A77-36245
- Synthetic fuels processing: Comparative economics; Proceedings of the Symposium, New York, N.Y., April 4-9, 1976 15 p0300 A77-36326
- Economics of crude oil and natural gas - Cost of adding production 15 p0300 A77-36327
- Economic evaluation by ERDA of alternative fossil energy technologies 15 p0300 A77-36328
- Economic comparison of synthetic fuels - Gasification and liquefaction 15 p0300 A77-36329
- The relative advantages of coal conversion routes for electric power generation --- economics of large scale installations 15 p0300 A77-36330
- Economic data for a 50,000 BPD Lurgi/Buhrigas shale oil plant 15 p0300 A77-36331
- Evaluation of the Lawrence Livermore Laboratory in-situ coal gasification concept 15 p0300 A77-36332
- Clean energy from Alaskan coals 15 p0301 A77-36333
- The IGT low-Btu gas process - Design and economics --- clean fuel gas from coal 15 p0301 A77-36335
- Fuel gas production via Koppers-Totzek gasification - An economic analysis 15 p0301 A77-36336
- Preliminary economic analysis - Oil and power by COED-based coal conversion 15 p0301 A77-36338
- Economics of ethylene production via pyrolysis of coal based Fischer-Tropsch hydrocarbons 15 p0301 A77-36339
- Comparative economics for the Arthur D. Little extractive coking process 15 p0301 A77-36340
- Economics of synthetic gas production by the SEGAS process 15 p0302 A77-36341
- Technology and economics of industrial fuel gas from coal 15 p0302 A77-36342
- Factors influencing the economics of large-scale in situ coal gasification operations 15 p0306 A77-36765
- Economic benefits of energy conservation 15 p0307 A77-36797
- Conventional gasification technologies 15 p0308 A77-36810
- Overview of energy supply and demand 15 p0313 A77-37653
- An economic assessment of fuelgas from water hyacinths 15 p0314 A77-37663
- Design, operation and economics of the energy plantation 15 p0315 A77-37667

- Future trends in electrical energy generation economics in the United States 15 p0317 A77-37960
- A United States energy model economically driven by a global growth simulation 15 p0319 A77-38220
- Answer House story --- utilizing solar cooling and solar heating 15 p0333 A77-39664
- Ultimate consumption of fuel and energy in the nonindustrial sector 15 p0334 A77-39668
- Energy assessment and possibilities of remote heat supply 15 p0338 A77-40350
- Economic assessment of the utilization of fuel cells in electric utility systems [AIAA 77-1012] 16 p0403 A77-41559
- Satellite solar power - Will it pay off [AIAA 77-1027] 16 p0404 A77-41567
- Have energy, will travel --- alternative aviation energy sources in the future 16 p0409 A77-41933
- Competitive restraints on air travel - Ground modes and telecommunications 16 p0409 A77-41939
- Economic aspects of U.S. energy independence in the coming decade 16 p0411 A77-42165
- Solar electricity - The hybrid system approach 16 p0413 A77-42556
- An econometric analysis of energy over the next 75 years 16 p0414 A77-42637
- Some impacts of restricting nuclear energy availability 16 p0415 A77-42857
- Solar power systems 16 p0416 A77-42895
- Economic analysis of solar total energy systems 16 p0416 A77-42896
- Economic competitiveness of windmills 16 p0417 A77-42898
- Electric vehicles - A major potential contribution to solution of U.S. energy problems 16 p0420 A77-44060
- Energy demand studies: Major consuming countries. Analyses of 1972 demand and projections of 1985 demand --- Book 16 p0428 A77-46094
- A preliminary cost benefit analysis of space colonization 16 p0431 A77-46771
- Powersats - An economic assessment 16 p0431 A77-46775
- Economics of solid waste conversion 16 p0433 A77-47211
- Solar powered steam generation 16 p0459 A77-48832
- Space power system design and development from an economic point of view 16 p0464 A77-48872
- Solar power satellite construction - Issues and needed technology 16 p0464 A77-48873
- Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018
- A solar/Stirling total energy system 16 p0481 A77-49021
- Shallow solar ponds for industrial process heat - The ERDA-Schio project 16 p0482 A77-49024
- Preliminary research on Ocean Energy Industrial Complexes 16 p0484 A77-49042
- A comparison of the economics of nuclear and solar power 16 p0485 A77-49049
- Payback of solar systems --- cost effectiveness evaluation by dynamic economical model 16 p0493 A77-49115
- Solar system market capture in the climate-economic regions of the United States 16 p0493 A77-49116
- Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- Economic study of solar total energy 16 p0494 A77-49124
- Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131
- Self sufficient energy integrated design and construction method for low cost-self help housing programs 16 p0495 A77-49137
- Design, operation and economics of the Energy Plantation 16 p0497 A77-49154
- On the study of applications of solar thermal energy for mobile homes 16 p0501 A77-50204
- Economics of solar heating with homeowner-type financing 16 p0501 A77-50210
- Assuring the performance of fossil energy programs 16 p0503 A77-50499
- Minerals in the US economy: Ten-year supply-demand profiles for mineral and fuel commodities [PB-252994/9] 13 p0085 N77-10624
- Waste heat vs conventional systems for greenhouse environmental control: An economic assessment [ORNL-TM-5069] 13 p0088 N77-10656
- A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results [PB-252485/8] 13 p0088 N77-10662
- SEASAT - A candidate ocean industry economic verification experiments [NASA-CR-149228] 13 p0104 N77-12476
- Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game [PB-255607/4] 13 p0105 N77-12502
- Preliminary economics and comment: In-situ gasification of coal for power and SNG [PB-256034/0] 13 p0109 N77-12554
- Analysis of fiscal year 1977 DOT program by policy and RD and D management objectives. Program levels for fiscal years 1975, 1976, 1977, volume 1 [PB-255401/2] 13 p0117 N77-13922
- Economic and technical feasibility study of compressed air storage [COO-2559-1] 13 p0122 N77-14593
- Economics of geothermal electricity generation from hydrothermal resources [BNWL-1989] 13 p0123 N77-14602
- Satellite power system: Engineering and economic analysis summary [NASA-TM-X-73344] 13 p0128 N77-15486
- Space-based solar power conversion and delivery systems study. Volume 3: Economic analysis of space-based solar power systems [NASA-CR-150148] 13 p0129 N77-15496
- Economic analysis of the need for advanced power sources [HEDL-SA-989] 13 p0131 N77-15509
- Report to Congress on the economic impact of energy actions [PB-256684/2] 14 p0208 N77-16450
- Macro-economic impact and other considerations in selecting energy conservation measures [PB-257678/3] 14 p0208 N77-16454
- Solar collector manufacturing activity, January-June 1976 [PB-258865/5] 14 p0208 N77-16455
- Report to Congress on the economic impact of energy actions [PB-257697/3] 14 p0218 N77-18596
- Energy resources alternatives competition [COO-2698-1] 14 p0224 N77-19635
- Engineering-economic model of residential energy use [ORNL-TM-5470] 14 p0231 N77-20580
- The 1985 technical coefficients for inputs to energy technologies [BNL-50532] 14 p0231 N77-20583
- Fuel cell benefit analysis [ANL-ES-51] 14 p0232 N77-20593
- Development of a low capital cost electrolyzer 14 p0239 N77-21596
- A western regional energy development study: Economics. Volume 1: SRI energy model results [PB-260835/4] 14 p0251 N77-21706

- Energy conversion and economics for geothermal power generation at Heber, California, Valles Caldera, New Mexico, and Ralt River, Idaho: Case studies [PB-261845/2] 14 p0251 N77-21712
- Energy input-output modelling: Problems and prospects [PB-261925/2] 15 p0349 N77-22679
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses [NASA-CR-137924] 15 p0353 N77-23073
- Energy models and large-scale systems optimization [AD-A033736] 15 p0365 N77-24619
- Study of the electric utility industry demand, costs, and rates [PB-262843/6] 15 p0367 N77-24631
- Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil [BNL-50538] 15 p0369 N77-24998
- Transportation programming, economic analysis, and evaluation of energy constraints [PB-262878/2] 15 p0370 N77-25018
- Costs and energy efficiency of a dual-mode system [NASA-CR-154251] 16 p0518 N77-29003
- Project Independence Evaluation System (PIES) documentation. Volume 8: Methodology for enabling the PIES oil and gas supply curves to respond to non-constant prices [PB-265086/9] 16 p0523 N77-29630
- An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components [PB-267629/4] 16 p0531 N77-31046
- Economic and budget impact of the President's energy proposals [GPO-93-689] 16 p0534 N77-31607
- Preliminary assessment of economics of hydrogen production from Lawrence Livermore Laboratory ZnSe thermochemical cycle [UCRL-13711] 16 p0536 N77-31626
- Economic analysis of solar water and space heating [DSE/2322-1-SUPPL] 16 p0536 N77-31627
- Market evaluation study: Solar heating and domestic hot water heating in DoD buildings [AD-A042178] 16 p0546 N77-32597
- Technical and economic studies of small reactors for supply of electricity and steam [IAEA-CN-36/398] 16 p0560 N77-33678
- ECONOMIC DEVELOPMENT**
- Energy-economy relationships [PB-255171/1] 13 p0099 N77-11552
- Rapid growth from energy projects: Ideas for state and local action. A program guide [PB-257374/9] 13 p0132 N77-15527
- Electric energy usage and regional economic development [PB-257544/7] 14 p0208 N77-16449
- Relationship of energy growth to economic growth under alternative energy policies [BNL-50500] 14 p0223 N77-19620
- Dynamics systems analysis of the relation between energy and the economy [BNL-21667] 14 p0235 N77-20931
- Space benefits: The secondary application of aerospace technology in other sectors of the economy [NASA-CR-152685] 15 p0352 N77-23010
- Summary description of the BOOM1 model --- simulating power plant impact on isolated communities [LA-6424-MS] 15 p0369 N77-25010
- RANN utilization experience (case studies 32 through 41) --- research applied to national needs [PB-263683/5] 15 p0370 N77-25027
- Optimization models for planning economic development [AD-A039165] 16 p0531 N77-31024
- ECONOMIC FACTORS**
- Legal and economic prerequisites to space industrialization [IAF PAPER ISI-76-29] 13 p0004 A77-10968
- A methodical approach concerning energy supply problems 13 p0016 A77-12062
- The conservation of air purity and its effect on the energy economy 13 p0049 A77-13811
- Geothermal energy as a source of electric power: Thermodynamic and economic design criteria --- Book 13 p0060 A77-16623
- Economic effectiveness of solar electric power stations 13 p0063 A77-17556
- The future of air transportation - Economic association considerations [AIAA PAPER 77-286] 13 p0065 A77-18222
- The two enemies of industrial development of solar energy - Simplicity and economy 13 p0078 A77-19109
- Economic and social impact of solar powered transportation systems 13 p0079 A77-19120
- Effect of the characteristics of electrical supply networks on the design of solar power plants 14 p0155 A77-21858
- Economic competitiveness of solar energy with conventional fuels and electricity 14 p0158 A77-22648
- Raw materials for energy generation in Canada 14 p0165 A77-23315
- Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078
- Comparison of coal conversion processes for electric power generation 14 p0192 A77-27288
- Energy in competition --- coal and nuclear energy 15 p0271 A77-32799
- Energy and the economy - An interrelated perspective 15 p0298 A77-36243
- A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen 15 p0302 A77-36343
- The economics of industrial process heat from solar energy 15 p0302 A77-36345
- Energy conservation and a healthy economy 15 p0305 A77-36612
- The year 2000 - Energy enough 15 p0306 A77-36725
- Sandia studies for ERDA central receiver thermal electric power project --- Solar generating system 15 p0318 A77-38208
- Economic and energy considerations in MHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
- Economic problems concerning the combustion of raw lignite 15 p0333 A77-39650
- Possibilities and limitations concerning the economy of solar heating systems 15 p0337 A77-39990
- North American freight transportation - Near or incipient chaos 16 p0410 A77-41943
- Methodological questions concerning the evaluation of the economic potential of energy resources 16 p0412 A77-42262
- Evaluation of energy policy 16 p0415 A77-42859
- Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743
- Economic aspects of Ocean Thermal Energy Conversion 16 p0484 A77-49041
- Assessment of the socio-economic and environmental aspects of the central receiver power plants 16 p0494 A77-49122
- Technical and socio-economic aspects of solar energy and rural development in developing countries 16 p0494 A77-49128
- Pumped storage optimization in generation systems 16 p0506 A77-51284
- Technical, economic, and environmental evaluation of in situ coal gasification 16 p0506 A77-51366
- Socio-economic determinants of a program for lunar industrialization in support of space light development Lunetta and Soletta [IAF PAPER A-77-66] 16 p0507 A77-51533
- A new approach to planning with gas turbines [ASME PAPER 77-JPGC-GT-3] 16 p0509 A77-51623

- The potential and economics of enhanced oil recovery  
[PB-254991/3] 13 p0066 N77-10633
- A linear economic model of fuel and energy in the  
United States. Volume 2: Submodels and data  
[PB-252486/6] 13 p0089 N77-10663
- Mathematics for energy  
[PB-252463/5] 13 p0098 N77-11543
- Inventory of energy research and development (1973  
- 1975), volume 3  
[GPO-64-734-VOL-3] 13 p0113 N77-13527
- Proposed energy conservation contingency plan:  
Emergency heating, cooling and hot water  
restrictions. Economic impact analysis.  
Environmental impact assessment  
[PB-258624/6] 14 p0217 N77-18584
- Report to Congress on the economic impact of  
energy actions  
[PB-257697/3] 14 p0218 N77-18596
- A study of geothermal prospects in the western  
United States  
[NASA-CR-149812] 14 p0220 N77-19575
- Technical and economic aspects of potential US  
district heating systems  
[BNL-21287] 14 p0232 N77-20594
- Economics and organization of metallurgical  
production: Effectiveness of the use of  
magnetic fields in melting alloy steels  
[BLN-N-25473-(5828.4F)] 15 p0359 N77-24245
- Energy situation in New England  
[BNL-50580] 15 p0381 N77-26650
- Factors affecting the corporate decisionmaking  
process of air transport manufacturers  
[NASA-CR-154618] 15 p0387 N77-27020
- Federal assistance programs and energy  
development-impacted municipalities  
[PB-265804/5] 16 p0519 N77-29026
- Energy Technologies for the West: Economic Growth  
and Energy  
[TID-27429] 16 p0538 N77-31648
- Regional economic impacts of nuclear power plants  
[BNL-50562] 16 p0540 N77-31676
- Alaska OCS socioeconomic studies program,  
literature survey  
[PB-269244/0] 16 p0549 N77-32681
- Improved engineering-economic model of residential  
energy use  
[ORNL-CO-8] 16 p0557 N77-33644
- ECONOMICS**
- Economics of depletable resources: Market forces  
and intertemporal bias  
[PB-255623/1] 13 p0111 N77-12930
- Economic study of solar total energy  
[SAND-76-5291] 14 p0216 N77-18574
- Economic evaluation of mixture and pure fluid  
cycles in ocean thermal energy conversion systems  
[ORO-4918-8] 14 p0217 N77-18578
- Report to Congress on the economic impact of  
energy actions  
[PB-257697/3] 14 p0218 N77-18596
- Regional energy system for the planning and  
optimization of national scenarios (RESPONS).  
Clean coal energy: Source-to-use economics  
project  
[ERDA-76-109] 14 p0222 N77-19602
- Technical and economic feasibility analysis of the  
no-fuel compressed air energy storage concept  
[BNWL-2065] 14 p0225 N77-19643
- An economic and performance design study of solar  
preheaters for domestic hot water heaters in  
North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- Economics of nuclear - electrolytic hydrogen  
14 p0247 N77-21659
- A simplified equilibrium model of the US  
energy-economic system and its use in comparing  
alternatives  
14 p0247 N77-21662
- Hydrogen economy analysis using decision theory  
14 p0247 N77-21663
- Economic feasibility: Fuel grade methanol from coal  
[TID-27156] 15 p0345 N77-22630
- Aviation economics --- commercial airlines  
[GPO-73-830] 15 p0352 N77-23008
- The future of natural gas: Economic myths,  
regulatory realities  
[PB-263625/6] 15 p0356 N77-23621
- Technology transfer from foreign direct investment  
in the United States. Report of a seminar series  
[PB-263012/7] 15 p0358 N77-24018
- An evaluation of SEASAT-A candidate ocean industry  
economic verification experiments  
[NASA-CR-153009] 15 p0361 N77-24561
- Determining the technical and economic feasibility  
of utilizing solar energy for heating buildings  
in Canada  
[NP-21308] 15 p0365 N77-24611
- Effects of alternative oil stockpiling programs on  
the US economy, 1976-1979  
[BNL-50541] 15 p0369 N77-24999
- Systems study of fuels from sugarcane, sweet  
sorghum, sugar beets, and corn  
[TID-27336] 15 p0377 N77-26324
- A social and economic impact study of offshore  
petroleum and natural gas development in Alaska,  
phase 1  
[PB-264705/5] 15 p0383 N77-26677
- Economic assessment of the utilization of fuel  
cells in electric utility  
[EPRI-EH-336] 15 p0392 N77-27516
- OPEC and the monopoly price of world oil (World  
Oil Project)  
[PB-265015/8] 16 p0518 N77-29001
- Unit commitment in large power systems: Economic  
priorities of steam units and applications of  
pumped-storage generation  
16 p0545 N77-32588
- An economic model of new crude oil and natural gas  
supplies in the lower 48 states  
16 p0552 N77-33596
- ECOSYSTEMS**
- Energy analysis and the coupling of man and  
estuaries  
15 p0290 A77-34449
- Emission and deposition of petrol engine exhaust  
Pb. I - Deposition of exhaust Pb to plant and  
soil surfaces  
15 p0333 A77-39655
- Perpetually renewable biomass prospects - A  
comparison of U.S. and Canadian ecosystem  
carrying capacities vs needs  
16 p0489 A77-49084
- EDDY CURRENTS**
- Two-dimensional analysis of end effects in  
diagonal type nonequilibrium plasma MHD generator  
15 p0297 A77-36097
- EDDY VISCOSITY**
- Calculation of turbulent magnetohydrodynamic  
boundary layers in MHD generator channels  
13 p0046 A77-13242
- EFFICIENCY**
- Resource utilization efficiency improvement of  
geothermal binary cycles, phase 1  
[ORO-4944-3] 13 p0123 N77-14600
- Photochemical conversion of solar energy  
[PB-262450/0] 15 p0366 N77-24628
- Investigation of GaAs solar cell potential  
performance and cost  
[AD-A040736] 16 p0553 N77-33612
- EFFLUENTS**
- Compilation of an inventory for particulate  
emissions in Belgium  
13 p0009 A77-11271
- Deashing of coal liquefaction products via partial  
deasphalting. I - Hydrogen-donor extraction  
effluents. II - Hydrogenation and  
hydroextraction effluents  
14 p0138 A77-20725
- The ecology of a marine littoral receiving  
effluents from a petroleum refinery  
16 p0433 A77-47173
- EIGENVECTORS**
- Characteristic equations of unconcentrated flat  
solar cell panels  
13 p0052 A77-14929
- ELECTRIC ARCS**
- A 2-MW electric arc generator with porous cooling  
of the interelectrode insert  
13 p0049 A77-13831
- Electric arc power collection for high-speed trains  
13 p0060 A77-16594
- ELECTRIC AUTOMOBILES**
- Small electric vehicle considerations in view of  
performance and energy usage  
13 p0024 A77-12698
- An analysis of electric vehicle mission, design,  
energy impact and cost  
13 p0024 A77-12700

- Selection of driving cycles for electric vehicles of the 1990's 13 p0024 A77-12702
- Application of a shunt motor and a 2 cylinder gasoline engine as a hybrid drive for an automobile 13 p0025 A77-12703
- Baseline test data for the EVA electric vehicle --- low energy consumption automobiles 13 p0025 A77-12704
- Electric vehicle performance with alternate batteries 13 p0025 A77-12707
- Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708
- Economic and social impact of solar powered transportation systems 13 p0079 A77-19120
- The computer simulation of automobile use patterns for defining battery requirements for electric cars 14 p0159 A77-22879
- A comparison between the primary energy consumption of electric and gasoline powered vehicles 14 p0159 A77-22885
- A development of high efficiency electric mini-cars 14 p0201 A77-29470
- The electric vehicle 15 p0307 A77-36798
- Running out of steam. III --- alternatives to internal combustion engine 15 p0310 A77-36984
- Electric vehicles - A major potential contribution to solution of U.S. energy problems 16 p0420 A77-44060
- The consumer's electric car --- Book 16 p0431 A77-46786
- Is an electric vehicle in your future 16 p0441 A77-48301
- Post-test analysis of Li/FeS<sub>2</sub> compact cells 16 p0448 A77-48739
- Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases [PB-263523/3] 15 p0354 A77-23518
- Electric vehicle research, development, and technology, foreign [AD-A040526] 16 p0542 A77-32034
- ELECTRIC BATTERIES**
- New electrochemical current sources 13 p0020 A77-12650
- The computer simulation of automobile use patterns for defining battery requirements for electric cars 14 p0159 A77-22879
- Development cost effective battery electric road vehicles 14 p0160 A77-22889
- Opportunities for battery powered road vehicles 14 p0160 A77-22892
- Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion 14 p0161 A77-22910
- Matching of solar cells and performance of a solar battery 15 p0256 A77-30316
- The electric vehicle 15 p0307 A77-36798
- Conference on Portable Power Sources in India, 1st, Calcutta, India, May 27, 28, 1976, Proceedings 16 p0420 A77-44052
- Some UK progress in sodium sulphur technology --- battery for electric motor vehicles [SAE PAPER 770280] 16 p0424 A77-44563
- A new design for the high-performance sodium-sulfur battery [SAE PAPER 770281] 16 p0424 A77-44564
- Sodium chloride battery development program for load leveling [PB-257570/2] 14 p0208 A77-16456
- Comparing the electric lead-acid battery vehicle with a hydrogen fueled vehicle incorporating an Fe-Ti hydride storage unit [BNL-20990] 14 p0211 A77-17577
- High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-9] 14 p0223 A77-19621
- Batteries for utility load leveling [CONF-760469-3] 14 p0231 A77-20579
- Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van [NASA-TN-X-73638] 14 p0236 A77-21549
- Methanol-air batteries [AD-A035942] 15 p0375 A77-25675
- Design of minimum-weight diffusion batteries [PB-266217/9] 16 p0518 A77-28645
- Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles [CONF-760617-3] 16 p0535 A77-31618
- Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045] 16 p0546 A77-32593
- Redox bulk energy storage system study, volume 1 [NASA-CR-135206-VOL-1] 16 p0553 A77-33608
- Redox bulk energy storage system study, volume 2 [NASA-CR-135206-VOL-2] 16 p0553 A77-33609
- Study of the auxiliaries for lead-acid battery systems for peaking power [CONS/2114-3] 16 p0556 A77-33634
- ELECTRIC BRIDGES**
- Curve of current delivered from MHD generator to a conventional power grid by inverter system 14 p0141 A77-21253
- ELECTRIC CELLS**
- Development of nickel-zinc batteries for aircraft 14 p0195 A77-28148
- Array power output of non-identical electrical cells 16 p0468 A77-48903
- ELECTRIC COILS**
- Application of a run around coil system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana [NASA-CR-149887] 14 p0229 A77-20561
- ELECTRIC CONDUCTORS**
- Three dimensional current distribution in diagonal conducting wall channels 15 p0329 A77-39556
- ELECTRIC CONTACTS**
- Automated fabrication of back surface field silicon solar cells with screen printed wraparound contacts [NASA-CR-135202] 16 p0546 A77-32590
- ELECTRIC CONTROL**
- Voltage consolidation and control circuits for multiple-electrode MHD generators 14 p0141 A77-21252
- Performance of an electric van fitted with a hydrodynamic torque converter transmission 14 p0160 A77-22897
- Hybrid simulation of fuel cell power conversion systems 16 p0414 A77-42636
- ELECTRIC CURRENT**
- Electric current from the direct conversion of low molecular weight C, H, O-compounds 13 p0055 A77-15814
- Curve of current delivered from MHD generator to a conventional power grid by inverter system 14 p0141 A77-21253
- The Tethered Balloon Current Generator - A space shuttle-tethered subsatellite for plasma studies and power generation 14 p0184 A77-26200
- Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field --- for MHD generator 15 p0295 A77-35798
- Applications of a doubly-fed induction machine in a large flywheel energy storage system 16 p0520 A77-29602
- ELECTRIC ENERGY STORAGE**
- Large-scale electrical power generation and storage 13 p0006 A77-11039
- Dependability of wind energy generators with short-term energy storage 13 p0046 A77-13423
- The potential for application of energy storage capacity on electric utility systems in the United States. I 13 p0054 A77-15625
- Problems of energy storage in solar power stations 13 p0063 A77-17555

# SUBJECT INDEX

# ELECTRIC GENERATORS

- Regression study of solar radiation and electrical energy consumption 14 p0137 A77-20686
- Air Force applications of lightweight superconducting machinery 14 p0144 A77-21360
- Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet 14 p0144 A77-21391
- Basic requirements for the various items of equipment for supplying energy to electrically driven road vehicles from the point of view of the user 14 p0160 A77-22890
- Studies of electric vehicle drives, illustrated by the example of an urban estate car 14 p0160 A77-22893
- Development of a high performance and lightweight hybrid flywheel/battery powered electric vehicle drive 14 p0160 A77-22898
- High-power systems with ac generators and inertial storage banks for electrophysical devices 15 p0261 A77-31426
- Storage batteries - The case and the candidates [AIAA 77-1007] 16 p0403 A77-41554
- An off-peak energy storage concept for electric utilities. I - Electric utility requirements 16 p0499 A77-49348
- Hydrogen for energy storage: A progress report of technical developments and possible applications [BNL-20931] 13 p0094 A77-11201
- The Redox flow system for solar photovoltaic energy storage [NASA-TM-X-73562] 13 p0106 A77-12522
- Electrically rechargeable REDOX flow cell [NASA-CASE-LEW-12220-1] 13 p0121 A77-14581
- Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet [LA-UR-76-1809] 14 p0235 A77-21325
- A wind energy system utilizing high pressure electrolysis as a storage mechanism 14 p0240 A77-21610
- A half megawatt Pulse Forming Network (PFN) [AD-A039709] 16 p0526 A77-30373
- Assessment of energy storage systems suitable for use by electric utilities, volume 3 [EPRI-EM-264-VOL-3] 16 p0537 A77-31636
- Redox bulk energy storage system study, volume 1 [NASA-CR-135206-VOL-1] 16 p0553 A77-33608
- Redox bulk energy storage system study, volume 2 [NASA-CR-135206-VOL-2] 16 p0553 A77-33609
- ELECTRIC EQUIPMENT**
- Research into the impact on electrical equipment from variable speed operation of pumped-storage plants [PB-268323/3] 16 p0548 A77-32618
- ELECTRIC EQUIPMENT TESTS**
- Results of baseline tests of the Lucas Limousine [NASA-TM-X-73609] 14 p0214 A77-17947
- ELECTRIC FIELD STRENGTH**
- Optimization of confinement in a toroidal plasma subject to strong radial electric fields 16 p0438 A77-47958
- ELECTRIC FIELDS**
- Structure of the electric field in the near-end space of a cylindrical electrode 15 p0295 A77-35607
- Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field --- for MHD generator 15 p0295 A77-35798
- Axial field limitations in MHD generators 15 p0328 A77-39552
- Field ionization for laser isotope separation [EPRI-NP-334] 16 p0552 A77-33512
- ELECTRIC FUSES**
- The magnetic energy storage system used in ZT-1 --- toroidal plasma pinch experiment 15 p0299 A77-36314
- ELECTRIC GENERATORS**
- Emergency power plant of rapid availability for the Berlin-Tegel airport 13 p0001 A77-10324
- Prospects of generating power with laser-driven fusion 13 p0002 A77-10634
- Optimization of current source operation in pulse mode --- for electrochemical generators [IAF PAPER 76-255] 13 p0003 A77-10952
- Energy conservation potential of Modular Integrator Utility Systems /MIUS/ 13 p0026 A77-12724
- Limiting capabilities with respect to electric power generation of a pulsed MHD generator operating at a resistive load 13 p0064 A77-17917
- Electric energy from atmospheric water vapor 13 p0077 A77-19097
- Status report on the German experimental study for terrestrial solar electric generators 14 p0153 A77-21836
- 100 MW large industrial gas turbine 14 p0155 A77-22022
- New energy systems - Associated thermodynamic cycles --- French book 14 p0162 A77-22924
- Rotor/generator isolation for wind turbines [AIAA 77-372] 14 p0180 A77-25782
- A method for increasing the efficiency of the electric generating process 14 p0183 A77-26087
- Alternative approaches to space-based power generation 14 p0199 A77-29066
- Thermal efficiency of geothermal power 14 p0205 A77-29788
- High-power systems with ac generators and inertial storage banks for electrophysical devices 15 p0261 A77-31426
- The design, fabrication and testing of a five megajoule monopolar motor-generation --- energy storage for controlled fusion experiments 15 p0299 A77-36311
- Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344
- Power supplies for full time fly-by-wire aircraft control systems 15 p0320 A77-38461
- Flywheel energy storage. I - Basic concepts 15 p0323 A77-39314
- Threshold capabilities of a pulsed MHD converter for the production of electric power with a resistive load 16 p0399 A77-40591
- Impact of air quality regulation on the electric power industry 16 p0452 A77-48775
- Environmental considerations in advanced energy conversion technology assessments 16 p0452 A77-48777
- An environmental assessment of liquid metal topping cycles --- in coal-fired fluidized bed processors for electric power generation 16 p0452 A77-48780
- Pressurized fluidized bed pilot plant for production of electric power using high sulfur coal 16 p0453 A77-48782
- Coal fired combined cycle for electric power generation 16 p0453 A77-48783
- Technology for power in space 16 p0463 A77-48865
- Thermoelectronic laser energy conversion for power transmission in space 16 p0464 A77-48876
- Recent Canadian activities in wind power 16 p0470 A77-48916
- Energy content of winds in the high plains region of southwestern U.S. 16 p0490 A77-49089
- Large windpower systems integrated with existing electric utilities 16 p0490 A77-49094
- The Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories 16 p0491 A77-49096
- Combined heat and electricity generation as a means for saving primary energy 16 p0505 A77-51155
- A new approach to planning with gas turbines [ASME PAPER 77-JPGC-GT-3] 16 p0509 A77-51623

- Geothermal energy for power generation  
[LA-UR-76-369] 13 p0087 N77-10650
- A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries  
[PB-255658/7] 13 p0115 N77-13542
- A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries  
[PB-255659/5] 13 p0115 N77-13543
- Electric power generation using geothermal brine resources for a proof-of-concept facility  
[NSF/RA/N-75-049] 13 p0123 N77-14603
- Development work for an advanced coal gasification system for electric power generation from coal directed toward a commercial gasification generating plant, phase 2  
[FE-1521-13] 13 p0130 N77-15501
- Composite material structures for thermophotovoltaic conversion radiator  
[AD-A026859] 13 p0132 N77-15519
- Solar energy: L-division miscellaneous  
[UCID-17177] 14 p0231 N77-20590
- Proceedings of Second Geopressed Geothermal Energy Conference. Volume 4: Surface technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- A theory of control for a class of electronic power processing systems: Energy-storage dc-to-dc converters  
[NASA-CR-152696] 15 p0344 N77-22614
- Potential of a solar collector with a stationary spherical reflector and a tracking absorber for electrical power production  
[SAND-76-8039] 15 p0345 N77-22636
- Geotechnical environmental aspects of geothermal power generation Heber, Imperial Valley, California  
[PB-260848/7] 15 p0349 N77-22680
- Program definition for the development of geothermal energy. Volume 3: Appendixes  
[NASA-CR-153223] 15 p0371 N77-25614
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 2: Summary and combined gas-steam turbine plant using coal derived liquid fuel  
[NASA-CR-134942-VOL-2] 15 p0379 N77-26629
- An analysis of the feasibility of windmills for power generation in New York State  
[RPT-TA-17] 15 p0380 N77-26638
- High power density MHD generators  
[AD-A038612] 15 p0397 N77-27983
- Applications of superconductivity in electric power systems  
[LA-UR-76-1998] 15 p0398 N77-27996
- Investigation of excitation control for wind-turbine generator stability  
[NASA-TN-73745] 16 p0535 N77-31614
- An initial comparative assessment of orbital and terrestrial central power systems  
[NASA-CR-155042] 16 p0546 N77-32594
- ELECTRIC MOTOR VEHICLES**
- Load leveling with electric vehicles in the urban environment  
13 p0024 A77-12701
- Ambient temperature electric vehicle batteries based on lithium and titanium disulfide  
13 p0025 A77-12706
- Electric vehicle performance with alternate batteries  
13 p0025 A77-12707
- Development status of lithium-silicon-iron sulfide load-leveling batteries  
13 p0026 A77-12714
- Electric vehicle batteries - Opportunities for materials improvement  
13 p0049 A77-13736
- Some studies on sodium/sulfur cells  
13 p0055 A77-15813
- Research on battery-operated electric road vehicles  
14 p0146 A77-21701
- The design and development of a hybrid-electric urban transit vehicle  
14 p0159 A77-22876
- Traction batteries for existing and future electric road vehicles  
14 p0159 A77-22878
- Hybrid propulsion systems for electric road vehicles for short range public passenger transport test and operational experience - Prospects  
14 p0159 A77-22881
- User experience with the Enfield car --- electric motor vehicle  
14 p0159 A77-22884
- Flywheel-electric hybrid vehicle  
14 p0159 A77-22886
- On-the-road evaluation of the efficiency of propulsion system of city vans  
14 p0160 A77-22888
- Development cost effective battery electric road vehicles  
14 p0160 A77-22889
- Basic requirements for the various items of equipment for supplying energy to electrically driven road vehicles from the point of view of the user  
14 p0160 A77-22890
- Comparison of an electric versus a gasoline powered utility truck in two years of a service test program  
14 p0160 A77-22891
- Opportunities for battery powered road vehicles  
14 p0160 A77-22892
- Studies of electric vehicle drives, illustrated by the example of an urban estate car  
14 p0160 A77-22893
- The nickel-zinc battery - A viable alternative for vehicle powering  
14 p0160 A77-22894
- Performance of an electric van fitted with a hydrodynamic torque converter transmission  
14 p0160 A77-22897
- Development of a high performance and lightweight hybrid flywheel/battery powered electric vehicle drive  
14 p0160 A77-22898
- The M.A.W. electrobus experience gained in large-scale tests  
14 p0160 A77-22900
- Impacts of future use of electric cars in US cities  
14 p0161 A77-22902
- Development of electric vehicles at Toyota  
14 p0161 A77-22904
- Sodium/sulphur battery design and development for motive power applications  
14 p0161 A77-22905
- Near-term advanced electric vehicle batteries  
14 p0161 A77-22909
- Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion  
14 p0161 A77-22910
- Development of large size nickel-zinc cells for electric vehicles  
14 p0161 A77-22911
- United States Postal Service Electric Vehicle Program  
14 p0161 A77-22912
- The DUO bus, a suburban bus with electric drive, supplied either from overhead wire or from battery  
14 p0161 A77-22913
- The lithium-water-air battery for automotive propulsion  
14 p0162 A77-22915
- Electric delivery vans above the 45th parallel in North America  
14 p0162 A77-22917
- Comparison of electric drives for road vehicles  
14 p0162 A77-22918
- Lithium-aluminum/metal sulfide batteries  
[ATAA PAPER 77-483] 14 p0172 A77-23903
- Basic research problems in the generation of electrochemical energy for powering small private vehicles  
14 p0180 A77-25721
- Will electricity power tomorrow's trains  
14 p0199 A77-29088
- Modeling of electric drive systems for K2W /flywheel/ vehicles  
14 p0200 A77-29469
- Electrochemical energy conversion. I - Electric vehicle propulsion  
15 p0303 A77-36410
- Advanced motor developments for electric vehicles  
15 p0305 A77-36615



## SUBJECT INDEX

## ELECTRIC POWER

Introduction to the ERDA electric and hybrid demonstration program --- electric and hybrid vehicle research and development 16 p0420 A77-43675

Some UK progress in sodium sulphur technology --- battery for electric motor vehicles [SAE PAPER 770280] 16 p0424 A77-44563

A study of the effects of new transportation systems on urban transportation and environment by computer simulation 16 p0430 A77-46652

The consumer's electric car --- Book 16 p0431 A77-46786

The zinc-bromine battery - Possible candidate for electric vehicles and load leveling 16 p0446 A77-48725

The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery 16 p0446 A77-48726

Design of a current technology electric vehicle 16 p0446 A77-48727

Flywheel module for electric vehicle regenerative braking 16 p0447 A77-48728

Results of baseline tests of the Lucas Limousine [NASA-TN-X-73609] 14 p0214 A77-17947

Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7] 15 p0361 A77-24504

Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system [PB-262513/5] 15 p0361 A77-24505

Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles [CONF-760617-3] 16 p0535 A77-31618

Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045] 16 p0546 A77-32593

Design and cost study of a zinc/nickel oxide battery for electric vehicle propulsion [ANL-K-76-3543-1] 16 p0556 A77-33635

**ELECTRIC MOTORS**

Research on battery-operated electric road vehicles 14 p0146 A77-21701

Studies of electric vehicle drives, illustrated by the example of an urban estate car 14 p0160 A77-22893

Comparison of electric drives for road vehicles 14 p0162 A77-22918

The design, fabrication and testing of a five megajoule monopolar motor-generation --- energy storage for controlled fusion experiments 15 p0299 A77-36311

Demonstration of an inductor motor/alternator/flywheel energy storage system [COO-4010-1] 16 p0535 A77-31620

**ELECTRIC NETWORKS**

Allocation of standby power units in terms of the output power, in planning the development of power systems 14 p0167 A77-23406

Hydrogen cycle peak-shaving on the New York State Grid using fuel cells 14 p0199 A77-29094

Pulsed energy and switching requirements for Tokamak ohmic heating [LA-UR-76-2473] 15 p0397 A77-27932

**ELECTRIC POTENTIAL**

Open-circuit voltage of silicon solar cells 14 p0151 A77-21820

A simplified technique for determining the boundary layer voltage loss in MHD generators 16 p0416 A77-42897

Low arc drop hybrid mode thermionic converter 16 p0466 A77-48890

**ELECTRIC POWER**

Photovoltaic and thermal energy conversion for solar powered satellites [IAF PAPER 76-117] 13 p0003 A77-10913

Satellite power systems for large-scale power generation [IAF PAPER 76-118] 13 p0003 A77-10914

Higher electric power use reduces energy consumption for same gross national product 13 p0011 A77-11334

The mysteries of nuclear programs --- energy conversion efficiency 13 p0011 A77-11337

Characteristic aspects of the evolution of the French electric balance in 1975 13 p0012 A77-11340

Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812

Is nuclear energy economically viable --- competition with coal 13 p0045 A77-12933

The potential for application of energy storage capacity on electric utility systems in the United States. I 13 p0054 A77-15625

Electric energy from atmospheric water vapor 13 p0077 A77-19097

Heating a building by means of solar and electrical energy 13 p0078 A77-19113

The energy situation in Canada 14 p0165 A77-23307

The dilemma of future electric power demand 14 p0167 A77-23391

Electricity and the energy 'gap' 14 p0195 A77-27890

Energy considerations related to the acquisition, supply, and utilization of solar energy 14 p0203 A77-29572

Equivalence of electricity and fuels - Contributing elements to a critical discussion 15 p0263 A77-31573

Simple thermal decomposition reactions for storage of solar thermal energy 15 p0292 A77-35153

The question of the utilization of geothermal energy in dry rocks /dry walls/ 15 p0303 A77-36348

Comparative energy policies of France, England, and Germany. II - Electricity and nuclear energy 15 p0324 A77-39505

The future of solar-thermal small-scale power stations 15 p0336 A77-39981

Types of city development, energy supply, and possibilities for optimization 15 p0338 A77-40349

The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface 16 p0414 A77-42634

Conceptual design of underground compressed air storage electric power systems 16 p0451 A77-48770

A hydrogen-halogen energy storage system for electric utility applications 16 p0457 A77-48818

Optimum operating conditions for a cylindrical parabolic focusing collector/Rankine power generation cycle system 16 p0468 A77-48905

Using Salton Sea Geothermal brines for electrical power: A review of progress in chemistry and materials technology - 1976 Status 16 p0469 A77-48908

Insolation and temperature statistics and their influence on the design of solar heating systems and the electric utility interface 16 p0479 A77-49000

A central receiver solar system applicable to central power stations 16 p0483 A77-49036

Wind-electric conversion utilizing field modulated generator systems 16 p0489 A77-49087

Synchronous inversion - Concept and application --- use of intermittent variable power sources to supplement primary sources 16 p0490 A77-49088

Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions 16 p0490 A77-49091

The application of wind power systems to the Minnesota Power and Light Company 16 p0490 A77-49092

- Electric energy supply alternatives for New York.  
Phase 2: An appraisal of electrical energy  
alternatives available to the State of New York  
[PB-249881/4] 13 p0101 N77-11575
- Planning models for the assessment of advanced  
energy storage systems 13 p0105 N77-12504
- Inventory of energy research and development (1973  
- 1975), volume 2 13 p0113 N77-13526  
[GPO-64-734-VOL-2]
- Electric power generation using geothermal brine  
resources for a proof-of-concept facility  
[NSF/RA/N-75-049] 13 p0123 N77-14603
- Development work for an advanced coal gasification  
system for electric power generation from coal  
directed toward a commercial gasification  
generating plant, phase 2 13 p0130 N77-15501  
[FE-1521-13]
- Solar energy, DFVLR activities 14 p0230 N77-20575  
[BRDA-TR-143]
- Long-range forecasting properties of  
state-of-the-art models of demand for electric  
energy. Volume 2: Annotated bibliography  
[PB-261766/0] 14 p0251 N77-21718
- The phasing out of natural gas and oil for  
electric power generation, southwest power pool  
and Electric Reliability Council of Texas. Part  
2: Technical and economic evaluation of various  
possible electric utility natural gas reduction  
programs, 1975 - 1990 15 p0356 N77-23617  
[PB-263505/0]
- Economy-wide impacts of interfuel substitution:  
Substitution of electricity for imported oil  
[BNL-50538] 15 p0369 N77-24998
- Residential demand for energy, volume 1  
[EPRI-EA-235-VOL-1] 16 p0530 N77-30629
- ELECTRIC POWER PLANTS**
- Performance theory of diagonal conducting wall MHD  
generators 13 p0001 A77-10202
- Making electricity from moderate temperature fluids  
--- geothermal sources 13 p0002 A77-10649
- Large-scale electrical power generation and storage  
13 p0006 A77-11039
- Total energy systems --- electric power generation  
with heat recovery 13 p0006 A77-11042
- The availability of fuels for power plants  
13 p0010 A77-11316
- Nuclear power - Compared to what --- energy  
alternatives for electric power generation  
13 p0017 A77-12234
- The significance of coal in the future energy  
picture 13 p0018 A77-12247
- The Osmotic power plant 13 p0021 A77-12668
- Steam station repowering - A near-term method of  
energy conservation 13 p0022 A77-12679
- Energy conservation with advanced power generating  
systems 13 p0026 A77-12723
- Underground storage of off-peak power  
13 p0027 A77-12728
- Storage in oil of off-peak thermal energy from  
large power stations 13 p0027 A77-12730
- Application of the Stretford process for H<sub>2</sub>S  
abatement at the Geysers geothermal power plant  
13 p0029 A77-12743
- Economic optimization of binary fluid cycle power  
plants for geothermal systems 13 p0029 A77-12744
- The economic generation of electricity from  
moderate temperature geothermal resources  
13 p0030 A77-12749
- Power production from high temperature geothermal  
waters 13 p0030 A77-12751
- Preliminary analysis of electric generation  
utilizing geopressed geothermal fluids  
13 p0030 A77-12752
- Liquid-metal magnetohydrodynamic system evaluation  
--- coal-fired designs 13 p0034 A77-12784
- Isotope heat source for dynamic power systems  
13 p0036 A77-12796
- Comparative performance of solar thermal power  
generation concepts 13 p0036 A77-12803
- Solar thermal electric power plants - Their  
performance characteristics and total social costs  
13 p0037 A77-12804
- Solar energy prospects for electric power  
generation in Brazil 13 p0037 A77-12805
- Central station solar electric power using liquid  
metal heat transport 13 p0037 A77-12806
- Windowed versus windowless solar energy cavity  
receivers 13 p0037 A77-12808
- New concepts in solar photovoltaic electric power  
systems design 13 p0038 A77-12817
- An experimental 200 kW vertical axis wind turbine  
for the Magdalen Islands 13 p0044 A77-12874
- Combination power plants for improved utilization  
of fossil fuels 13 p0045 A77-12939
- MHD - Energy transformation by burning coal  
13 p0045 A77-12940
- A hydride compressor 13 p0046 A77-13336
- Hydrogen storage via iron-titanium for a 26 MW/e/  
peaking electric plant 13 p0048 A77-13543
- Experiment on MHD generator with a large-scale  
superconducting magnet /ETL Mark V/ 13 p0049 A77-13726
- Some material considerations involved in the  
application of solar energy to electric power  
generation 13 p0049 A77-13739
- Problems of energy storage in solar power stations  
13 p0063 A77-17555
- Economic effectiveness of solar electric power  
stations 13 p0063 A77-17556
- Nova Scotia seeks to cut oil bill for power  
generation 13 p0063 A77-17588
- Increase in the efficiency of heat and power  
systems using large artificial accumulators of  
heat 13 p0064 A77-17939
- Gas turbine electric powerplants  
[AIAA PAPER 77-346] 13 p0066 A77-18254
- Wind power --- wind-powered plant design  
14 p0136 A77-20042
- Coal gasification and its relation to tested power  
plants 14 p0136 A77-20074
- Some results of an investigation with the U-25  
experimental-industrial facility, aimed at  
raising its parameters to the design level ---  
MHD generator energy converter 14 p0136 A77-20105
- Heat tests with a GT-35 gas turbine as an element  
of steam-gas facility with a high-pressure steam  
generator 14 p0136 A77-20109
- Flue gas desulfurization experience 14 p0136 A77-20381
- Electric load management and energy conservation  
14 p0137 A77-20685
- On the solar energy problem --- for heat and  
electric power production 14 p0138 A77-20742
- Composition and size distribution of in-stack  
particulate material at a coal-fired power plant  
14 p0139 A77-21018
- Problems of analysis of the power characteristic  
of a high capacity magnetohydrodynamic power  
station 14 p0143 A77-21270
- Solar energy and electric utilities - Should they  
be interfaced 14 p0143 A77-21281
- Superconducting magnets for an MHD test facility  
and base load power plant 14 p0144 A77-21379
- International Conference on Solar Electricity,  
Toulouse, France, March 1-5, 1976, Reports  
14 p0147 A77-21776

- Evaluation of CdS photovoltaic cells in the framework of the development of solar electric power plants 14 p0149 A77-21796
- Use of solar water-heating installations in the combined cycle of a thermal electric power plant 14 p0152 A77-21825
- Problems relating to heat storage --- at solar thermal power plant 14 p0152 A77-21826
- Utilization of solar radiation in large solar power plants with hydraulic storage 14 p0152 A77-21827
- Turbines and turbogenerators for solar power plants with thermodynamic cycles 14 p0152 A77-21828
- Thermal optimization of steam generating systems for tower type solar steam power plants - Tasks and methods 14 p0152 A77-21830
- A study on solar tower power system 14 p0152 A77-21832
- Thermal energy of oceans 14 p0153 A77-21833
- 10 MW solar thermal electric power plant design for solar day operation 14 p0153 A77-21842
- Development of a 10 kWe solar thermal power station 14 p0154 A77-21844
- Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost 14 p0154 A77-21845
- A modular fixed-mirror Brayton-cycle solar power system 14 p0154 A77-21846
- Effect of the characteristics of electrical supply networks on the design of solar power plants 14 p0155 A77-21858
- Combined gas/steam cycle power and heat generating plants 14 p0155 A77-22023
- Energy storage in the form of latent heat 14 p0157 A77-22350
- Fuel cells - Prospects of their applications for electric utilities 14 p0165 A77-23306
- Low-Btu gas from coal has many potential markets 14 p0165 A77-23309
- Pumped-storage electric power generating plants 14 p0166 A77-23373
- Allocation of standby power units in terms of the output power, in planning the development of power systems 14 p0167 A77-23406
- New requirements for the development and design of thermal power systems 14 p0167 A77-23407
- Fuel cells - A sleeper in the energy race 14 p0170 A77-23647
- Utilization of heat of geothermal springs and waste hot waters in freon-operated power plants 14 p0175 A77-24207
- Possible applications of geothermal energy in France 14 p0175 A77-24208
- Heat exchangers for the Ocean Thermal Energy Power Plant 14 p0176 A77-24219
- Energy from the wind 14 p0179 A77-25575
- Performance of low cost solar reflectors for transferring sunlight to a distant collector 14 p0180 A77-25896
- Environmental considerations of converting fossil-fueled power plants from oil or natural gas to coal 14 p0181 A77-26043
- Solar thermal electric power systems - Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474
- PULSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544
- More about geothermal steam or the hottest energy prospect ever --- Book 14 p0191 A77-26925
- Comparison of coal conversion processes for electric power generation 14 p0192 A77-27288
- Fluidized bed combustion 14 p0192 A77-27290
- Geothermal development and the Salton Sea 14 p0194 A77-27352
- Geothermal energy development 14 p0194 A77-27881
- Hydrocarbon fuel conditioner for a 1.5 kW fuel cell power plant 14 p0195 A77-28168
- Servo positioning power tower collectors for solar heat conversion to electricity 14 p0198 A77-28811
- Composition method for constructing guaranteed-output curves of solar- and wind-power plants utilized jointly 14 p0201 A77-29534
- Development of solar tower program in the United States 14 p0204 A77-29591
- An educated ray trace approach to solar tower optics 14 p0204 A77-29592
- Solar-heated-air receivers --- of solar/gas turbine electrical generation plant design 15 p0255 A77-30312
- Analysis of electrical power generation costs 15 p0257 A77-30600
- Optimal unit commitment --- electric power system operating mode for cost reduction 15 p0260 A77-30812
- Solar-thermal power systems 15 p0262 A77-31474
- Critical comments concerning the application of the availability concept in power plant technology 15 p0265 A77-31850
- Particle size distributions of dusts in the flue gas of power plants and in atmospheric air 15 p0265 A77-31889
- Production of electricity through thermodynamic conversion of solar energy - 10 MWe project 15 p0270 A77-32591
- Solar tower characteristics 15 p0274 A77-33333
- Commodity hydrogen from off-peak electricity 15 p0283 A77-33403
- The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496
- Cut energy costs: A guide for buying and plant operation --- industrial energy saving techniques 15 p0290 A77-34642
- A method for evaluating SO2 abatement strategies 15 p0293 A77-35169
- Contribution to the solution of planning problems in electric power generation /effects of random disturbances/ 15 p0294 A77-35399
- Operation results of the desulfurization plant for a thermal power station 15 p0299 A77-36279
- The relative advantages of coal conversion routes for electric power generation --- economics of large scale installations 15 p0300 A77-36330
- Preliminary economic analysis - Oil and power by COED-based coal conversion 15 p0301 A77-36338
- Design of closed-cycle MHD generator with nonequilibrium ionization and system 15 p0303 A77-36381
- 100 MWe solar power plant design configuration and performance [AAS 75-288] 15 p0305 A77-36556
- Toward establishing a national energy policy 15 p0307 A77-36767
- Gasification and generation of electricity --- coal utilization 15 p0308 A77-36812
- An assessment of energy storage systems suitable for use by electric utilities 15 p0310 A77-36982
- Tidal power generation in India 15 p0310 A77-36988
- Coal gasification power generation 15 p0310 A77-37000
- Fuel gas and electricity from municipal sewage 15 p0314 A77-37658
- Environmental studies of the St. Louis-Union Electric refuse firing demonstration 15 p0315 A77-37669

- Future trends in electrical energy generation economics in the United States 15 p0317 A77-37960
- An application of the economic-environmental power dispatch --- decision approach for controlling air pollution emission from electric power generation 15 p0317 A77-38121
- Progress on the selective removal of H<sub>2</sub>S from gasified coal using an immobilized liquid membrane 15 p0318 A77-38146
- An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207
- A heat capacitor for MHD electric power generation systems 15 p0331 A77-39571
- Dynamic modeling and control of magnetohydrodynamic/steam electrical power generating plants 15 p0332 A77-39572
- Part-load performance and voltage-current characteristics of a base load MHD generator 15 p0332 A77-39573
- Economic and energy considerations in MHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
- MHD systems with low cooling requirements 15 p0332 A77-39575
- Coal fired non-equilibrium closed cycle MHD power plant system since ECAS --- Energy Conversion Alternatives Study 15 p0332 A77-39576
- Status of the reference dual-cycle MHD-steam power plant 15 p0332 A77-39577
- Open-cycle coal burning MHD power plants for commercial service 15 p0333 A77-39578
- Further studies on the oxidation of sulfur dioxide in coal-fired power plant plumes 15 p0333 A77-39657
- Dynamic characteristics of the desulfurization plant boiler draft system for power stations 15 p0338 A77-40201
- Problems in the use of oil shale as an energy source 16 p0399 A77-40523
- Solar thermal electricity - Power tower dominates research 16 p0400 A77-40647
- Thermal storage for electric utilities [AIAA 77-1009] 16 p0403 A77-41556
- Utility views of MHD power generation [AIAA 77-1010] 16 p0403 A77-41557
- Improvement in phosphoric acid cell powerplant technology [AIAA 77-1011] 16 p0403 A77-41558
- Economic assessment of the utilization of fuel cells in electric utility systems [AIAA 77-1012] 16 p0403 A77-41559
- Gas turbine HTGR - A total energy utilization option --- High Temperature Gas-cooled Reactor [AIAA 77-1016] 16 p0403 A77-41560
- Integration of solar generation into electric utility systems [AIAA 77-1020] 16 p0404 A77-41562
- Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563
- Optimum concentration ratio for a solar central-receiver electric power plant 16 p0409 A77-41865
- A pressurized fluidized bed coal fired combined cycle electric power generation [AIAA PAPER 77-1013] 16 p0412 A77-42482
- Electric energy alternatives appraisal for New York State 16 p0413 A77-42632
- Economic competitiveness of windmills 16 p0417 A77-42898
- Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants 16 p0420 A77-44178
- A terrestrial solar thermal electric power system - Development of basic model system 16 p0422 A77-44478
- Northeastern utilities are meeting the clean air challenge 16 p0424 A77-44612
- Some observations on the selection of gas turbine generating plant 16 p0429 A77-44613
- Power with heliostats 16 p0433 A77-47174
- Idealization of complex dynamic systems with examples involving electrical energy systems --- Russian book 16 p0434 A77-47331
- Impact of advanced fuel fusion on electric power transmission 16 p0436 A77-47361
- Closed costs of electrical energy for different zones of load graphs of electrical energy systems 16 p0437 A77-47751
- An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system 16 p0437 A77-47752
- Conceptual design of closed Brayton cycle for coal-fired power generation 16 p0445 A77-48714
- Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant 16 p0445 A77-48717
- Development of the Westinghouse coal gasification process - A status report 16 p0446 A77-48722
- 4.8-megawatt fuel cell module demonstrator 16 p0447 A77-48738
- Dynamic modeling of fluidized bed boilers for control system design 16 p0454 A77-48792
- A comparison of three working fluids for the design of geothermal power plants 16 p0455 A77-48800
- Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California --- in geothermal resources exploitation 16 p0455 A77-48801
- Geothermal power cycle analysis 16 p0455 A77-48803
- A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute 16 p0458 A77-48823
- Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825
- Development status - Binary Rankine cycle waste heat recovery system 16 p0459 A77-48828
- Combined diesel-organic Rankine-cycle power plant 16 p0459 A77-48830
- Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- Thermal energy storage 16 p0461 A77-48841
- Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant 16 p0461 A77-48842
- Design of sodium-cooled, central receiver solar power plant 16 p0461 A77-48843
- Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design 16 p0461 A77-48844
- 1 MWth solar cavity steam generator solar test program 16 p0461 A77-48846
- Increased central station power plant efficiency with a thermionic topping system 16 p0467 A77-48894
- Evaluation of MHD-thermionic-steam cycles 16 p0467 A77-48895
- Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018
- Conceptual design of an open cycle gas turbine solar central receiver system 16 p0481 A77-49022
- Smith multimodule solar-electric plant 16 p0482 A77-49023

## SUBJECT INDEX

## ELECTRIC POWER PLANTS CONTD

- Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications 16 p0483 A77-49031
- Solar thermal electric power systems - Comparison of line focus collectors 16 p0483 A77-49032
- Turntable solar arrays 16 p0483 A77-49033
- Technical feasibility of a modular dish solar electric system 16 p0483 A77-49034
- Central receiver solar thermal power 16 p0484 A77-49037
- Economic aspects of Ocean Thermal Energy Conversion 16 p0484 A77-49041
- Preliminary research on Ocean Energy Industrial Complexes 16 p0484 A77-49042
- Design of low-cost aluminum heat exchangers for OTEC plant-ships --- Ocean Thermal Energy Conversion 16 p0485 A77-49046
- Gravel and liquid storage system for solar thermal power plants 16 p0491 A77-49101
- High-temperature energy storage in native rocks 16 p0492 A77-49104
- Power generation: Air pollution monitoring and control --- Fook 16 p0504 A77-51126
- Eliminate source emission codes for coal-refuse fired power plants 16 p0504 A77-51128
- Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station 16 p0504 A77-51135
- Pumped storage optimization in generation systems 16 p0506 A77-51284
- A summary of the ECAS MHD power plant results [NASA-TN-X-73491] 13 p0086 A77-10642
- Advanced coal gasification system for electric power generation --- pollution monitoring [PB-1514-176] 13 p0088 A77-10653
- The proceedings of the NOx Control Technology Seminar [PB-253661/3] 13 p0092 A77-10707
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California [PB-254449/2] 13 p0092 A77-10720
- Selected aspects of waste heat management: A state-of-the-art study [PB-255697/5] 13 p0100 A77-11563
- Theoretical, numerical, and physical techniques for characterizing power plant plumes [PB-253099/6] 13 p0101 A77-11599
- Physical and biological aspects of thermal pollution in sea water --- forecasting electric power production in Italy [ISS-L-75/14] 13 p0109 A77-12560
- Assessment of the impact of proposed thermal effluent guidelines for the steam electric power industry [PB-255937/5] 13 p0110 A77-12587
- Laboratory analysis of solvent refined coal [PB-255550/6] 13 p0110 A77-12598
- Assessment of power system security under load uncertainty 13 p0112 A77-13324
- Design phase utility analysis for gas turbine and combined cycle plants [PB-256665/1] 13 p0115 A77-13553
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report [PB-257444/0] 13 p0116 A77-13554
- National benefits associated with commercial application of fuel cell powerplants [ERDA-76-54] 13 p0123 A77-14597
- Precipitation scavenging of fossil-fuel effluents [PB-256649/5] 13 p0124 A77-14630
- Proceedings of the Stationary Source Combustion Symposium. Volume 3: Field Testing and Surveys [PB-257146/1] 13 p0125 A77-14643
- Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power [ERDA-76-69] 13 p0130 A77-15506
- Economic analysis of the need for advanced power sources [HEDL-SA-989] 13 p0131 A77-15509
- An improved electrolyte for direct oxidation fuel cells [AD-A026164] 13 p0131 A77-15518
- Sodium chloride battery development program for load leveling [PB-257570/2] 14 p0208 A77-16456
- Existing and proposed fuel conversion facilities. Summary [PB-258264/1] 14 p0208 A77-16457
- Penetration analysis and margin requirements associated with large-scale utilization of solar power plants [PB-257546/2] 14 p0208 A77-16459
- Summary report of three powerplant productivity studies [PB-257764/1] 14 p0212 A77-17598
- Solar pilot plant, phase 1 [SAM/1109-76/T1] 14 p0216 A77-18571
- Geothermal R and D project report, 1 January - 31 March 1976 [ANCR-1319] 14 p0222 A77-19607
- Modular 5 MW geothermal power plant design considerations and guidelines [UCRL-13684] 14 p0222 A77-19612
- Control of waste and water pollution from power plant flue gas cleaning systems [PB-259211/1] 14 p0227 A77-19953
- Technical and economic feasibility of US district heating systems using waste heat from fusion reactors [BNL-50516] 14 p0232 A77-20606
- Energy conversion and economics for geothermal power generation at Heber, California, Valles Caldera, New Mexico, and Ralt River, Idaho: Case studies [PB-261845/2] 14 p0251 A77-21712
- Development program for solid electrolyte batteries [PB-260719/0] 15 p0341 A77-22398
- An optimization study of a low thermal potential power system [AD-A031709] 15 p0348 A77-22666
- Electric power development in the Pacific Northwest Region: Institutional commitments and alternatives, phase 1 [PB-262382/5] 15 p0348 A77-22671
- Electric utility finance workshop [PB-261661/3] 15 p0349 A77-22677
- Conceptual design of a 10MW regenerative isobutane geothermal power plant [PB-261563/1] 15 p0349 A77-22683
- Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant [PB-261564/9] 15 p0349 A77-22684
- Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany [ANL-ES-50] 15 p0365 A77-24612
- Study of the electric utility industry demand, costs, and rates [PB-262843/6] 15 p0367 A77-24631
- Role of the heat storage well future U.S. energy systems [PB-263480/6] 15 p0367 A77-24634
- PCB emissions from stationary sources: A theoretical study [PB-262850/1] 15 p0367 A77-24665
- Trends in power plant capacity and utilization. Inventory of power plants in the United States [PB-264451/6] 15 p0373 A77-25655
- Projects to expand fuel sources in eastern states: Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976) [PB-262361/9] 15 p0374 A77-25669
- Measurement of dry deposition of fossil fuel plant pollutants [PB-264495/3] 15 p0376 A77-25685

## ELECTRIC POWER SUPPLIES

## SUBJECT INDEX

- Assembly and testing of a 1.8 by 3.7 meter Fresnel lens solar concentrator  
[NASA-CR-150300] 15 p0378 N77-26610
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 1: Summary and combined gas-stream turbine plant with an integrated low-BTU gasifier  
[NASA-CR-134942-VOL-1] 15 p0379 N77-26628
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 2: Summary and combined gas-stream turbine plant using coal derived liquid fuel  
[NASA-CR-134942-VOL-2] 15 p0379 N77-26629
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 3: Summary and advanced steam plant with pressurized fluidized bed boilers  
[NASA-CR-134942-VOL-3] 15 p0379 N77-26630
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary  
[NASA-CR-134949-VOL-1] 15 p0379 N77-26631
- Energy Conversion Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach  
[NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles  
[NASA-CR-134949-VOL-2-PT-2] 15 p0379 N77-26633
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 3: Open cycle gas turbines and open cycle MHD  
[NASA-CR-134949-VOL-2-PT-3] 15 p0379 N77-26634
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results  
[NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment  
[NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment  
[NASA-CR-134955] 15 p0380 N77-26637
- Superconducting energy storage development for electric utility systems  
[LA-UR-76-2294] 15 p0381 N77-26649
- Will a rapidly expanding power-generating system be part of the energy problem or part of its solution  
[UCRL-78500] 15 p0381 N77-26651
- Air pollution and the siting of fossil fuel power plants  
[ANL-76-IX-14] 15 p0386 N77-26708
- Structural reform in the electric power industry  
[PB-264589/3] 15 p0389 N77-27316
- Coal conversion program. Energy Supply and Environmental Coordination Act (as amended). Section 2  
[PB-265815/1] 15 p0393 N77-27542
- Central receiver solar thermal power system, phase 1  
[SAN/111C-76/2] 15 p0394 N77-27551
- Report of the Hearing Panel: National Public hearing on Power Plant Compliance with Sulfur Oxide Air Pollution Regulations  
[PB-264891/3] 15 p0396 N77-27625
- High power density MHD generators  
[AD-A038612] 15 p0357 N77-27983
- Solar energy and electric utilities: Can they be interfaced?  
[ANL-ES-52] 16 p0515 N77-28601
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model  
[PB-264822/8] 16 p0517 N77-28628
- Evaluation of molten scrubbing for fine particulate control  
[PB-266092/6] 16 p0517 N77-28642
- A parametric utility comparison of coal and nuclear electricity generation  
[PB-266064/5] 16 p0523 N77-29634
- ERDA's central receiver solar thermal power system studies  
16 p0526 N77-30279
- Evaluation of phase 2 conceptual designs and implementation assessment resulting from the Energy Conversion Alternatives Study (ECAS) --- coal utilization in electric power generation  
[NASA-TM-73515] 16 p0527 N77-30598
- Summary report: An exploratory study of cost targets for solar electric power plants  
[ORNL-TM-5787] 16 p0538 N77-31654
- Summary of cost and quality of electric utility plant fuels, 1976  
[PB-267368/9] 16 p0543 N77-32335
- Environmental assessment of geopressured waters and their projected uses  
[PB-268289/6] 16 p0544 N77-32579
- Unit commitment in large power systems: Economic priorities of steam units and applications of pumped-storage generation  
16 p0545 N77-32588
- Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3  
[PB-268492/6] 16 p0548 N77-32615
- Projected thermodynamic efficiencies of fusion power plants  
[BNWL-2017] 16 p0550 N77-32958
- Thermal energy storage demonstration unit for Vuilleumier cryogenic cooler  
[AD-A040895] 16 p0553 N77-33613
- Technical and economic feasibility of solar augmentation for boiler feedwater heating in steam-electric power plants  
[COO-2864-1] 16 p0555 N77-33626
- Application of the Alstom/Exxon alkaline fuel cell system to utility power generation  
[EPRI-EM-384] 16 p0557 N77-33643
- Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment  
[PB-269270/5] 16 p0561 N77-34058
- ELECTRIC POWER SUPPLIES**
- Superflywheel energy storage and nonsynchronous AC/DC/AC electric transmission supplements power system operation  
13 p0002 A77-10638
- Solar energy --- conversion technology assessment  
13 p0006 A77-11037
- The overcoming of energy deficiencies with the aid of wind power  
13 p0008 A77-11174
- Electricity and heat production - Energy efficiency versus cost efficiency  
13 p0011 A77-11338
- Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies  
13 p0018 A77-12361
- Electric utility companies and geothermal power  
13 p0031 A77-12759
- The potential national benefits of geothermal electrical energy production from hydrothermal resources in the West  
13 p0031 A77-12760
- Comparison of candidate solar array maximum power utilization approaches --- for spacecraft propulsion  
13 p0041 A77-12836
- KIPS - Kilowatt Isotope Power System --- for use in satellites  
13 p0041 A77-12837
- SNAP 19 Viking RTG mission performance  
13 p0041 A77-12840
- Fuel cells --- electrochemical energy conversion  
13 p0055 A77-15804
- Some studies on sodium/sulfur cells  
13 p0055 A77-15813
- Electric arc power collection for high-speed trains  
13 p0060 A77-16594
- Electric power supply in the case of airports. I  
13 p0061 A77-16742
- Solar thermal power generation  
13 p0077 A77-19095
- Economic and social impact of solar powered transportation systems  
13 p0079 A77-19120
- Demand electric rates - A new problem and challenge for solar heating  
14 p0137 A77-20388

## SUBJECT INDEX

## ELECTRIC POWER TRANSMISSION

Voltage consolidation and control circuits for multiple-electrode MHD generators 14 p0141 A77-21252

A power plant of the Aeroselec type 14 p0153 A77-21839

Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia 14 p0153 A77-21840

The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854

Some applications of photovoltaic solar energy 14 p0155 A77-21855

Simulation of wind turbine generator system power flow dynamics 14 p0158 A77-22650

Flywheel-electric hybrid vehicle 14 p0159 A77-22886

Sodium/sulphur battery design and development for motive power applications 14 p0161 A77-22905

Fuel cells - Prospects of their applications for electric utilities 14 p0165 A77-23306

Electrochemical battery trends for aircraft and missile applications [AIAA PAPER 77-481] 14 p0172 A77-23901

Performance analysis of a solar-electrical system with a load and storage batteries 14 p0177 A77-24570

Oxygen accumulation and electrolyte loss in nickel hydrogen cells 14 p0195 A77-28157

Low cost dynamic energy conversion systems 14 p0196 A77-28171

Solar generators - Utilization of solar energy for supply of electric power 14 p0197 A77-28681

Hydrogen cycle peak-shaving on the New York State Grid using fuel cells 14 p0199 A77-29094

Use of solar generators in Africa for broadcasting equipment 15 p0256 A77-30320

Power supplies for full time fly-by-wire aircraft control systems 15 p0320 A77-38461

Storage batteries - The case and the candidates [AIAA 77-1007] 16 p0403 A77-41554

Economic assessment of the utilization of fuel cells in electric utility systems [AIAA 77-1012] 16 p0403 A77-41559

The possibility of using regression models for calculating the effect of weather conditions on electric energy demand 16 p0411 A77-42259

Utilization of wind energy for electrical power supplies to ESSOR stationary platforms --- tropospheric tethered balloon experiment 16 p0427 A77-45610

The electrical power system for Spacelab 16 p0432 A77-46789

4.8-megawatt fuel cell module demonstrator 16 p0447 A77-48738

Recent progress in development of sodium-sulfur battery for utility application 16 p0448 A77-48740

Miniature solar-electric power system 16 p0462 A77-48848

Reactor hybrid-Organic Rankine Cycle Electric Power Systems (ORCEPS) for space applications 16 p0463 A77-48858

Effect of solar home heating on electric utilities 16 p0494 A77-49123

Costs of alternative sources of electricity [PB-255765/0] 13 p0107 N77-12528

Assessment of cadmium sulfide photovoltaic arrays for large scale electric utility applications [PB-255646/2] 13 p0109 N77-12551

Investment planning in the energy sector [LBL-4474] 13 p0125 N77-14948

Participating surveillance services for electric power program. Coal conversion and utilization: Direct combustion of coal-90e, advanced power-90f. Summary for IRDA annual report, CY 1975 [FE-1236-4] 13 p0130 N77-15507

Possible effects of nuclear initiative on supply and use of electricity in California [AD-A026582] 13 p0131 N77-15510

Integrating community utilities for resource conservation [PB-256898/8] 13 p0133 N77-15923

Navy applications for terrestrial photovoltaic solar power [AD-A030529] 14 p0218 N77-18590

Commodity hydrogen from off-peak electricity 14 p0245 N77-21641

MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems [ORNL-HUD-MIUS-6] 14 p0249 N77-21684

Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities) 15 p0346 N77-22644

Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement [PB-261153/1] 15 p0346 N77-22645

Sources of energy data for Illinois [PB-262562/2] 15 p0350 N77-22686

Electric utility coal consumption and generation trends, 1976-1985 [PB-262483/1] 15 p0374 N77-25667

Economic assessment of the utilization of fuel cells in electric utility [EPRI-EM-336] 15 p0392 N77-27516

Factors affecting the electric power supply, 1980-85: Executive summary and recommendations [PB-264760/0] 15 p0395 N77-27560

Electric utility solar energy activities, 1976 survey [EPRI-EE-321-SR] 16 p0515 N77-28598

FEA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers [PB-265706/2] 16 p0517 N77-28615

Project Independence Evaluation System (PIES) documentation. Volume 13: Coal and electric utility conventions for PIES [PB-265824/3] 16 p0519 N77-29326

The environmental effects of using coal for generating electricity [PB-267237/6] 16 p0524 N77-29655

Impact of alternative energy forms on public utilities 16 p0525 N77-30275

Methodology for the analysis of the impacts of electric power production in the West [IA-6720-PB] 16 p0533 N77-31428

Proceedings of the Workshop on Analysis of 1974 and 1975 Power Growth [EPRI-EA-318-SR] 16 p0536 N77-31633

Study of electric and gas utilities and the public service commission of Nevada [PB-268481/9] 16 p0547 N77-32605

Analysis and forecast of electrical distribution system materials. Volume 3: Appendix [CONS/2050-1-VOL-3-APP] 16 p0551 N77-33430

Report of the Advisory Commission on Electric Power Alternatives [PB-268479/3] 16 p0559 N77-33668

**ELECTRIC POWER TRANSMISSION**

Energy transmission from ocean thermal energy conversion plants 13 p0032 A77-12773

Solar energy and electric utilities - Should they be interfaced 14 p0143 A77-21281

Solar electric power generating stations in space - XXI century energy or a utopia 15 p0269 A77-32470

Impact of advanced fuel fusion on electric power transmission 16 p0436 A77-47361

Experimental study of several modes of operation of a laboratory section of a three-phase superconducting power transmission cable 16 p0438 A77-47753

Assessment of power system security under load uncertainty 13 p0112 N77-13324

- Non-nuclear energy technology. Low temperature cable for power transmission [BNFT-FE-T-76-01] 14 p0210 N77-17372
- Brookhaven superconducting cable test facility [BNL-21780] 14 p0236 N77-21331
- Ocean thermal energy delivery systems based on chemical energy carriers 14 p0240 N77-21609
- ELECTRIC PROPULSION**
- Power source requirements of electric propulsion systems used for north-south stationkeeping of communication satellites 13 p0040 A77-12833
- NASA electric propulsion program [AIAA PAPER 76-1068] 13 p0045 A77-13033
- Electric vehicle batteries - Opportunities for materials improvement 13 p0049 A77-13736
- Superconducting machinery for Naval ship propulsion 14 p0144 A77-21361
- Results of baseline tests of the Lucas Limousine [NASA-TM-X-73609] 14 p0214 N77-17947
- High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-9] 14 p0223 N77-19621
- Electric vehicle research, development and technology - foreign [AD-A036458] 16 p0512 N77-28419
- ELECTRIC PULSES**
- Pulsed energy conversion with a dc superconducting magnet 13 p0081 A77-19293
- PULSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544
- A multi-megajoule inertial-inductive energy storage system 15 p0299 A77-36292
- ELECTRIC ROCKET ENGINES**
- Status of SERT 2 thrusters and spacecraft 1976 [NASA-TM-X-73501] 13 p0083 N77-10149
- ELECTRIC WIRE**
- Design modification of Femco Model 702909 wireless ground monitor --- for use in strip mining [PB-262858/4] 15 p0360 N77-24371
- ELECTRICAL ENGINEERING**
- Transport systems guarantee efficient utilization of energy resources 13 p0053 A77-15048
- ELECTRICAL FAULTS**
- Axial field limitations in MHD generators 15 p0328 A77-39552
- Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator 15 p0329 A77-39554
- ELECTRICAL GROUNDING**
- Design modification of Femco Model 702909 wireless ground monitor --- for use in strip mining [PB-262858/4] 15 p0360 N77-24371
- ELECTRICAL INSULATION**
- Increasing the electrical strength of the interelectrode gap in an MHD generator 16 p0428 A77-46091
- ELECTRICAL MEASUREMENT**
- An experimental investigation of fluctuating properties within a combustion MHD generator 15 p0330 A77-39559
- Cell and module test procedures seen from the manufacturer and the user point of view 16 p0527 N77-30537
- Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045] 16 p0546 N77-32593
- ELECTRICAL PROPERTIES**
- Air electrodes for H<sub>2</sub>-air fuel cells with alkali electrolyte 13 p0065 A77-18196
- Experimental investigation of multiple-loaded diagonal conducting wall generators 15 p0325 A77-39529
- Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel 15 p0328 A77-39550
- Electrical behavior of slag coatings in coal-fired MHD generators 15 p0328 A77-39551
- Cast polycrystalline silicon Schottky-barrier solar cells 16 p0503 A77-50295
- Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature [NASA-CR-155166] 16 p0553 N77-33604
- ELECTRICAL RESISTANCE**
- Reducing grain-boundary effects in polycrystalline silicon solar cells 13 p0014 A77-11761
- An analysis of silicon solar cell parameters for terrestrial applications 13 p0076 A77-19081
- Optimization of silicon solar cell design for use under concentrated sunlight 15 p0257 A77-30714
- Sheet resistance component of series resistance in a solar cell as a function of grid geometry 16 p0402 A77-41437
- Elimination of current concentration due to Hall effect by variable resistive electrodes 16 p0418 A77-43119
- Degradation of solar cell efficiency by sheet resistance 16 p0438 A77-47854
- Resistance of superconducting-normal metal-superconducting sandwiches [LBL-5473] 15 p0341 N77-22393
- ELECTRICAL RESISTIVITY**
- Electrical conductivity of molten coal slags containing potassium seed 15 p0330 A77-39565
- ELECTRICITY**
- Geothermal energy for electrical and nonelectrical applications [LA-UR-76-418] 13 p0123 N77-14601
- Electric energy usage and regional economic development [PB-257544/7] 14 p0208 N77-16449
- Hydrogen-via-electricity: A candidate transitional transportation energy system concept [ERDA-77-13] 16 p0514 N77-28596
- ELECTRIFICATION**
- Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia 14 p0153 A77-21840
- ELECTRO-OPTICS**
- An electrooptical model for the design of semiconductor solar cells --- French book 16 p0429 A77-46469
- ELECTROCATALYSTS**
- Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte 13 p0055 A77-15815
- Fuel cell assemblies with an acidic electrolyte 13 p0055 A77-15816
- Air electrodes for H<sub>2</sub>-air fuel cells with alkali electrolyte 13 p0065 A77-18196
- A comparison of porous silver catalysts in oxygen electrodes of alkaline fuel cells 13 p0067 A77-18350
- Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts --- for fuel cells 14 p0176 A77-24568
- On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells 16 p0425 A77-45151
- ERDA Fuel Cell Applied Research Program 16 p0447 A77-48736
- The electron factor in catalysis on metals electrocatalysis on non-metallic surfaces [PB-256264/3] 13 p0103 N77-12166
- Carbon oxidation catalyst mechanism study for fuel cells [PB-256420/1] 13 p0115 N77-13551
- Surface research for development of new electrocatalysts for acid electrolyte fuel cells [AD-A026053] 13 p0131 N77-15517
- Investigation of acid-resistant electrocatalysts for fuel cells [NASA-TT-F-17367] 14 p0207 N77-16444
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 14 p0238 N77-21593



# SUBJECT INDEX

# ELECTRODES

- Fuel cells and solid electrolytes  
[AD-A033782] 15 p0366 N77-24630
- ELECTROCHEMICAL CELLS**
- Performance characteristics of solid  
lithium-aluminum alloy electrodes 13 p0007 A77-11107
- Energy recovery from saline water by means of  
electrochemical cells 13 p0013 A77-11536
- New electrochemical current sources 13 p0020 A77-12650
- Photoassisted electrolysis of water - Conversion  
of optical to chemical energy 13 p0021 A77-12666
- Energy conversion via photoelectrolysis 13 p0021 A77-12667
- Electrochemical power and hydrogen generation from  
high temperature electrolytic cells 13 p0025 A77-12709
- Development of compact lithium/iron disulfide  
electrochemical cells 13 p0026 A77-12715
- The theory of hydrogen production in a  
photoelectrochemical cell 13 p0075 A77-19075
- Alternating photoelectrochemical converters 13 p0077 A77-19093
- Hydrogen production by photoelectrochemistry in  
visible light 14 p0150 A77-21813
- Method of investigation, experimental results, and  
optimization criteria for photoelectrochemical  
converters 14 p0151 A77-21814
- The lithium-water-air battery for automotive  
propulsion 14 p0162 A77-22915
- Electrochemical battery trends for aircraft and  
missile applications [AIAA PAPER 77-481] 14 p0172 A77-23901
- Photoelectrochemical energy conversion and storage  
- The polycrystalline CdSe cell with different  
storage acids 14 p0196 A77-28463
- The theory of hydrogen production in a  
photoelectrochemical cell 15 p0279 A77-33370
- Cathodes for photodriven hydrogen generators -  
ZnTe and CdTe 15 p0296 A77-35921
- Electrochemical energy conversion. II - Utilities,  
marine and space applications 16 p0400 A77-40686
- The power conversion efficiency of the  
gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583
- Electrobiological neutralization of acid mine water 16 p0420 A77-43651
- The influence of parameter dispersion of  
electrical cells on the array power output 16 p0420 A77-44264
- On the application of radiorisotope techniques for  
the study of phthalocyanine catalyzed  
electrochemical processes in fuel cells 16 p0425 A77-45151
- Hydrogen and electricity from water and light 16 p0430 A77-46609
- The zinc-bromine battery - Possible candidate for  
electric vehicles and load leveling 16 p0446 A77-48725
- Molten carbonate fuel cell model 16 p0447 A77-48737
- Improved negative electrodes for lithium/iron  
sulfide batteries 16 p0448 A77-48742
- N-CdS/n-GaAs voltage-enhanced photoanode --- in  
photoelectrochemical solar cell 16 p0503 A77-50287
- Hydrogen for energy storage: A progress report of  
technical developments and possible applications  
[BNL-20931] 13 p0094 A77-11201
- Fuel cells and solid electrolytes  
[AD-A033782] 15 p0366 N77-24630
- ELECTROCHEMICAL CORROSION**
- Corrosion problems related to the employment of  
aluminum in collector construction 14 p0202 A77-29566
- Anodic oxidation of ethylene glycol with noble  
metal alloy catalysts --- in fuel cell 15 p0260 A77-31171
- Supercorrodng alloys for generating heat and  
hydrogen gas 16 p0458 A77-48820
- Water electrolysis under pressure: Improvement of  
energy efficiency by temperature increase 14 p0238 N77-21594
- ELECTROCHEMICAL MACHINING**
- Disposal of toxic wastes. I - Electroplating and  
electrochemical machining wastes. II - Poisonous  
and radioactive wastes 15 p0305 A77-36608
- ELECTROCHEMICAL OXIDATION**
- Measurement of the excess oxidant ratio in the  
combustion products of an MHD-generator 14 p0136 A77-20107
- Oxidation of methanol on agitated bed electrodes  
using non-metallic electrocatalysts --- for fuel  
cells 14 p0176 A77-24568
- Improved acid electrolytes for the hydrocarbon-air  
fuel cell 14 p0195 A77-28166
- ELECTROCHEMISTRY**
- Fuel cells --- electrochemical energy conversion 13 p0055 A77-15804
- A comparison of porous silver catalysts in oxygen  
electrodes of alkaline fuel cells 13 p0067 A77-18350
- Description of a new photoelectrochemical generator 14 p0150 A77-21812
- Basic research problems in the generation of  
electrochemical energy for powering small  
private vehicles 14 p0180 A77-25721
- Prospects for hydrogen production by water  
electrolysis to be competitive with conventional  
methods 15 p0277 A77-33359
- Theoretical treatment of the photoelectrochemical  
production of hydrogen --- semiconductor  
electrode for solar applications 15 p0321 A77-38530
- Development progress on the Sulfur Cycle Water  
Decomposition System --- for hydrogen production 16 p0457 A77-48813
- Research on electrochemical energy conversion  
systems [AD-A023689] 13 p0090 N77-10681
- Optimization of PT-doped Kocite (trademark)  
electrodes in H3 PO4 fuel cells [AD-A025326] 13 p0107 N77-12529
- Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process 14 p0238 N77-21582
- Optimization of PT-doped Kocite (R) trademark  
electrodes in H3 PO4 fuel cells [AD-A034604] 15 p0365 N77-24618
- Optimization of platinum-doped Kocite electrodes in  
H3PO4 fuel cells [AD-A039242] 16 p0529 N77-30626
- Review of electrochemical impregnation for nickel  
cadmium cells --- aerospace applications  
[NASA-CR-155155] 16 p0552 N77-33601
- ELECTROCONDUCTIVITY**
- Conductivity of seeded combustion products of  
acetylene systems 15 p0288 A77-34039
- Some properties of coal slags of importance to MHD 15 p0330 A77-39563
- Thermal efficiency of solid electrolyte fuel cells  
with mixed conduction 16 p0500 A77-50199
- ELECTRODEPOSITION**
- Review of electrochemical impregnation for nickel  
cadmium cells --- aerospace applications  
[NASA-CR-155155] 16 p0552 N77-33601
- ELECTRODES**
- Performance characteristics of solid  
lithium-aluminum alloy electrodes 13 p0007 A77-11107
- Advances in component technology for nickel-zinc  
cells 13 p0025 A77-12710

Review of electrode designs and fabrication techniques for lithium-aluminum/iron sulfide cells  
13 p0025 A77-12713

Advanced thermionic converter development  
13 p0043 A77-12862

A new hydrogen storage electrode  
13 p0047 A77-13539

Diffuse thermal model of electrode erosion for MHD generators  
13 p0049 A77-14319

Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides  
13 p0056 A77-15817

Air electrodes for H<sub>2</sub>-air fuel cells with alkali electrolyte  
13 p0065 A77-18196

A comparison of porous silver catalysts in oxygen electrodes of alkaline fuel cells  
13 p0067 A77-18350

Test results on the spinel electrode module in laboratory and simulated MHD environment  
14 p0140 A77-21227

Development of large size nickel-zinc cells for electric vehicles  
14 p0161 A77-22911

Hydrogen producing cycles using electricity and heat - Hydrogen halide cycles: Electrolysis of HBr  
14 p0171 A77-23719

Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts --- for fuel cells  
14 p0176 A77-24568

Generalized analysis of thermoelectric device configurations  
14 p0177 A77-24572

Oxygen accumulation and electrolyte loss in nickel hydrogen cells  
14 p0195 A77-28157

Cathode spots on metallic electrodes of an MHD-channel  
15 p0269 A77-32518

The theory of hydrogen production in a photoelectrochemical cell  
15 p0279 A77-33370

The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility  
15 p0327 A77-39540

Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel  
15 p0328 A77-39550

Electrical behavior of slag coatings in coal-fired MHD generators  
15 p0328 A77-39551

Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator  
15 p0329 A77-39554

Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells  
16 p0420 A77-44059

Porous electrodes for Zn/air alkaline battery  
16 p0431 A77-46722

Development status of lithium-silicon/iron sulfide load leveling batteries  
16 p0448 A77-48741

Thermionic converter studies at Thermo Electron  
16 p0466 A77-48887

Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell  
16 p0500 A77-50200

High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-81]  
15 p0345 A77-22631

Optimization of PT-doped Kocite (R) trademark electrodes in H<sub>3</sub> PO<sub>4</sub> fuel cells [AD-A034604]  
15 p0365 A77-24618

Fuel cells and solid electrolytes [AD-A033782]  
15 p0366 A77-24630

Fabrication and testing of large size nickel-zinc cells [NASA-CR-135200]  
16 p0529 A77-30610

Optimization of platinum-doped Kocite electrodes in H<sub>3</sub>PO<sub>4</sub> fuel cells [AD-A039242]  
16 p0529 A77-30626

Hydrogen-halogen energy storage system: Preliminary feasibility and economic assessment [BNL-22164]  
16 p0537 A77-31635

Development and characterization of materials for open cycle MHD [BNWL-2004-3]  
16 p0541 A77-31969

**ELECTRODYNAMICS**

Influence of various losses on the characteristics of high-power MHD generators  
13 p0046 A77-13258

Effect of various losses on the characteristics of powerful MHD generators  
15 p0263 A77-31538

Effect of two-dimensional inhomogeneities on the properties of framed MHD channels  
16 p0428 A77-46088

Electrofluid dynamics energy conversion research [AD-A029066]  
14 p0218 A77-18593

**ELECTROHYDRODYNAMICS**

Investigation of a coaxial explosion-type MHD generator  
15 p0268 A77-32313

A consideration of some three-dimensional effects in MHD channel  
15 p0330 A77-39560

An investigation of electrohydrodynamic heat pipes [NASA-CR-151977]  
15 p0342 A77-22422

**ELECTROLYSIS**

Photoassisted electrolysis of water - Conversion of optical to chemical energy  
13 p0021 A77-12666

Hydrogen from solar energy via water electrolysis  
13 p0032 A77-12771

Energy storage via calcium hydride production  
13 p0032 A77-12774

Nuclear driven water decomposition plant for hydrogen production  
13 p0035 A77-12791

Hydrogen production using solar radiation  
13 p0048 A77-13540

The storage of energy in future energy supply systems [DGLR PAPER 76-182]  
13 p0059 A77-16533

Hydrogen producing cycles using electricity and heat - Hydrogen halide cycles: Electrolysis of HBr  
14 p0171 A77-23719

Competitively priced hydrogen via high-efficiency nuclear electrolysis  
14 p0171 A77-23720

Performance data for a terrestrial solar photovoltaic/water electrolysis experiment  
15 p0256 A77-30321

Hydrogen production with HOT ELLY --- high temperature vapor phase-electrolysis of water  
15 p0269 A77-32404

Hydrogen production from nuclear waste energy  
15 p0274 A77-33331

Peak power and heavy water production from electrolytic H<sub>2</sub> and O<sub>2</sub> using CANDU reactors  
15 p0274 A77-33332

Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process  
15 p0276 A77-33350

The Westinghouse Sulfur Cycle for the thermochemical decomposition of water  
15 p0277 A77-33354

Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle  
15 p0277 A77-33356

Recent developments of large electrolytic hydrogen generators  
15 p0277 A77-33358

Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
15 p0277 A77-33359

Water electrolysis under pressure - Improvement of energy efficiency by temperature increase  
15 p0277 A77-33360

Performance characteristics of a high-pressure, moderate temperature, electrolysis system --- for hydrogen-based energy storage  
15 p0277 A77-33361

Development of a low capital cost electrolyzer --- for hydrogen production  
15 p0277 A77-33362

Modern technology electrolysis for power application  
15 p0278 A77-33364

# SUBJECT INDEX

# ELECTROLYTIC CELLS

A wind energy system utilizing high pressure electrolysis as a storage mechanism 15 p0279 A77-33376

Commodity hydrogen from off-peak electricity 15 p0283 A77-33403

Hydrogen energy - Its potential premises and problems 15 p0284 A77-33410

EPDA's hydrogen programs 15 p0284 A77-33412

Will the large-scale production of hydrogen be part of the energy problem or part of its solution 15 p0284 A77-33415

Economics of nuclear-electrolytic hydrogen 15 p0285 A77-33419

Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344

Thermolysis or electrolysis - Why we choose the latter --- water splitting for hydrogen production 15 p0321 A77-38528

Photoelectrolysis with YFeO<sub>3</sub> electrodes --- water splitting using solar energy 16 p0399 A77-40553

Hydrogen by electrolysis to supplement pipeline gas supplies Technical and economic aspects [AIAA 77-1032] 16 p0405 A77-41569

Hydrogen-via-Electricity - A candidate transitional transportation energy system concept [AIAA 77-1034] 16 p0405 A77-41570

The future of hydrogen as an energy source --- nuclear-powered water electrolysis 16 p0438 A77-47848

Prospects for hydrogen production by water electrolysis to be competitive with conventional methods [BNL-20877] 13 p0C87 A77-10648

Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [DLR-FE-76-32] 13 p0114 A77-13541

Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0237 A77-21558

The Westinghouse sulfur cycle for the thermochemical decomposition of water 14 p0238 A77-21587

Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle 14 p0238 A77-21589

First World Hydrogen Energy Conference proceedings, volume 2 14 p0238 A77-21591

Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 14 p0238 A77-21593

Water electrolysis under pressure: Improvement of energy efficiency by temperature increase 14 p0238 A77-21594

Performance characteristics of a high-pressure, moderate temperature, electrolysis system 14 p0238 A77-21595

Modern technology electrolysis for power application --- concerning hydrogen production 14 p0239 A77-21598

Hydrogen generation by photoelectrolysis of water 14 p0240 A77-21605

A wind energy system utilizing high pressure electrolysis as a storage mechanism 14 p0240 A77-21610

Economics of nuclear - electrolytic hydrogen 14 p0247 A77-21659

Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [ESA-TT-338] 14 p0251 A77-21701

Hydrogen storage, water electrolysis and fuel cells for electric energy storage [BNL-21498] 15 p0344 A77-22620

Space power technology applied to the energy problem 16 p0526 A77-30294

Hydrogen generation process [FE-2262-3] 16 p0533 A77-31337

## ELECTROLYTES

Improved acid electrolytes for the hydrocarbon-air fuel cell 14 p0195 A77-28166

Thermal efficiency of solid electrolyte fuel cells with mixed conduction 16 p0500 A77-50199

Solid Polymer Electrolyte (SPE) fuel cell technology, program review, phase 2 [NASA-CR-150957] 13 p0097 A77-11532

Semiconductor-electrolyte photovoltaic energy converter [PB-252837/0] 13 p0099 A77-11548

Surface research for development of new electrocatalysts for acid electrolyte fuel cells [AD-A026053] 13 p0131 A77-15517

An improved electrolyte for direct oxidation fuel cells [AD-A026164] 13 p0131 A77-15518

Development program for solid electrolyte batteries [PB-260719/0] 15 p0341 A77-22398

High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-81] 15 p0345 A77-22631

Optimization of platinum-doped Kocite electrodes in H<sub>2</sub>PO<sub>4</sub> fuel cells [AD-A039242] 16 p0529 A77-30626

## ELECTROLYTIC CELLS

A multilayer iron-thionine photogalvanic cell 13 p0007 A77-11108

Electrochemical power and hydrogen generation from high temperature electrolytic cells 13 p0025 A77-12709

Advances in component technology for nickel-zinc cells 13 p0025 A77-12710

Development of sodium/sulfur-cells 13 p0026 A77-12716

Sodium/sulphur battery development in the United Kingdom 13 p0026 A77-12717

Some studies on sodium/sulfur cells 13 p0055 A77-15813

Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte 13 p0055 A77-15815

Fuel cell assemblies with an acidic electrolyte 13 p0055 A77-15816

Investigation of a TiO<sub>2</sub>/electrolyte solar cell and the photocatalytic water decomposition 13 p0077 A77-19094

Sodium/sulphur battery design and development for motive power applications 14 p0161 A77-22905

The lithium-water-air battery for automotive propulsion 14 p0162 A77-22915

Oxygen accumulation and electrolyte loss in nickel hydrogen cells 14 p0195 A77-28157

Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe 15 p0259 A77-30742

Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 15 p0278 A77-33365

Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters 15 p0320 A77-38330

Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells 15 p0320 A77-38367

A new design for the high-performance sodium-sulfur battery [SAE PAPER 770281] 16 p0424 A77-44564

Rechargeability studies of ambient temperature lithium/sulfur batteries 16 p0447 A77-48729

The storability of Li/SO<sub>2</sub> cells 16 p0447 A77-48730

ERDA Fuel Cell Applied Research Program 16 p0447 A77-48736

Post-test analysis of Li/Pes<sub>2</sub> compact cells 16 p0448 A77-48739

Development status of lithium-silicon/iron sulfide load leveling batteries 16 p0448 A77-48741

New separators for nickel-zinc batteries  
[NASA-TM-X-3465] 13 p0121 N77-14585

Recent developments of large electrolytic hydrogen  
generators 14 p0238 N77-21592

Development of a low capital cost electrolyzer 14 p0239 N77-21596

Hydrogen production plants using electrolytic  
cells with low cost electrodes built into  
pressure tanks 14 p0239 N77-21599

Optimization of platinum-doped Kocite electrodes in  
H<sub>3</sub>PO<sub>4</sub> fuel cells [AD-A039242] 16 p0529 N77-30626

**ELECTROLYTIC POLARIZATION**

Near-uv photon efficiency in a TiO<sub>2</sub> electrode -  
Application to hydrogen production from solar  
energy 13 p0015 A77-11947

**ELECTROMAGNETIC FIELDS**

Analogy between thermal-convective and  
magnetohydrodynamic instabilities 16 p0425 A77-44690

**ELECTROMAGNETIC INTERFERENCE**

Photovoltaic system test facility electromagnetic  
interference measurements [NASA-TM-X-73640] 15 p0343 N77-22608

**ELECTROMAGNETIC MEASUREMENT**

Remote sensing of an underground coal-burn cavity  
with a wide-band induction system 13 p0007 A77-11050

**ELECTROMAGNETIC PROPULSION**

Mass driver retrievals of earth-approaching  
asteroids --- earth orbit capture for mining  
purposes [AIAA PAPER 77-528] 15 p0265 A77-32053

**ELECTROMAGNETIC RADIATION**

Monitoring fluid flow by using high-frequency  
electromagnetic probing [UCRL-51579] 13 p0120 N77-14393

Theoretical analysis of the EREC report  
[NASA-CR-152542] 15 p0390 N77-27493

**ELECTROMAGNETS**

A large conventional MHD magnet 16 p0503 A77-50433

**ELECTROMECHANICAL DEVICES**

Performance of an electric van fitted with a  
hydrodynamic torque converter transmission 14 p0160 A77-22897

High-power systems with ac generators and inertial  
storage tanks for electrophysical devices 15 p0261 A77-31426

Electrochemical energy conversion. I - Electric  
vehicle propulsion 15 p0303 A77-36410

Electromechanical stabilization system 16 p0511 N77-28211

**ELECTROMECHANICS**

A possible correlation of the neutron yield to the  
electromechanic work in Mather-type plasma focus  
devices 13 p0061 A77-17017

**ELECTROMOTIVE FORCES**

Thermoelectric power of pseudoternary solid  
solutions 13 p0014 A77-11917

**ELECTRON ACCELERATORS**

Electron beam research at Sandia Laboratories, USA  
--- for inertial confinement fusion 14 p0138 A77-20706

**ELECTRON BEAMS**

Electron beam research at Sandia Laboratories, USA  
--- for inertial confinement fusion 14 p0138 A77-20706

A microwave energy converter with a reversing  
magnetic field 14 p0139 A77-21154

Overview of energy research and development  
administration inertial confinement fusion program 14 p0146 A77-21744

Silicon solar cells by high-speed low-temperature  
processing 15 p0258 A77-30728

Electron beam heated sciencid reactors for fusion  
power and fissile fuel breedings 16 p0459 A77-48827

The 120-keV beam direct conversion system for FTR  
injectors [UCRL-52137] 15 p0355 N77-23610

**ELECTRON DENSITY (CONCENTRATION)**

Electron concentration measurements in combustion  
MHD flows by submillimeter laser interferometry 16 p0425 A77-44821

**ELECTRON DENSITY PROFILES**

Boundary layer measurements of temperature and  
electron number density profiles in a combustion  
MHD generator 15 p0288 A77-33710

**ELECTRON DIFFUSION**

Response of a partially illuminated solar cell 14 p0139 A77-21025

Increase of diffusion lengths of minority carriers  
under the effect of a width gradient of the  
forbidden band 14 p0151 A77-21823

Analysis of silicon solar cells with stripe  
geometry junctions 14 p0156 A77-22079

Photovoltaic properties and junction formation in  
CuInSe<sub>2</sub> 15 p0305 A77-36584

**ELECTRON EMISSION**

Thermonic emission characteristics of seeded coal  
slags 14 p0140 A77-21229

**ELECTRON ENERGY**

Construction of two-dimensional steady-state  
solution of equations of a nonequilibrium  
magnetized plasma 13 p0065 A77-18130

On the construction of plane stationary solutions  
of equations for nonequilibrium magnetized plasma 16 p0420 A77-43705

Status of research on advanced thermonic converters 16 p0466 A77-48889

**ELECTRON IRRADIATION**

Radiation effects on high efficiency silicon solar  
cells 13 p0064 A77-18072

Radiation effects on high efficiency silicon solar  
cells --- for spacecraft application 16 p0416 A77-42892

**ELECTRON MICROSCOPES**

Epitaxial silicon technology for low-cost solar  
cells [PB-262396/5] 15 p0374 N77-25663

**ELECTRON OSCILLATIONS**

Methods of 'tailoring' ion distributions in phase  
space /'morphodynamics'/ --- in Migma-type  
fusion reactors 16 p0436 A77-47364

**ELECTRON PARAMAGNETIC RESONANCE**

Hydrogen atoms: Rare earth ions: Magnetic  
resonance studies on polycrystalline solids and  
surface systems relevant to catalysis and other  
energy-related research 13 p0117 N77-13798

**ELECTRON PLASMA**

Status of research on advanced thermonic converters 16 p0466 A77-48889

**ELECTRON RECOMBINATION**

Response of a partially illuminated solar cell 14 p0139 A77-21025

Fundamental electronic mechanisms limiting the  
performance of solar cells 15 p0257 A77-30710

**ELECTRON SPECTROSCOPY**

Thermonic converter performance with oxide  
collectors 16 p0466 A77-48888

**ELECTRON TRANSFER**

Biological solar energy conversion: Approaches to  
overcome yield, stability and product limitations  
[PB-267937/1] 16 p0554 N77-33619

**ELECTRON TRANSITIONS**

Measurements of Sc I gf-values --- absorption  
spectroscopy using heat pipe oven 13 p0058 A77-16270

**ELECTRONIC CONTROL**

Bosch technical instruction. Gasoline injection D  
and L-jetronic [NASA-TT-P-17111] 13 p0095 N77-11399

**ELECTRONIC EQUIPMENT**

Cooling arrays of circuit cards using heat pipes  
and forced air diffusers 13 p0031 A77-12766

## SUBJECT INDEX

## ENERGY BANDS

- ELECTRONIC MODULES**  
Use of heat pipes in electronic hardware  
16 p0526 N77-30293
- ELECTROPHORESIS**  
Charge characteristics of particles in coal  
derived liquids - Measurement and origin  
16 p0412 A77-42408
- ELECTROPHOTOMETRY**  
Experimental facility for measuring spatial and  
energy characteristics of solar concentrators  
14 p0179 A77-25356  
Experimental setup for measuring space and energy  
characteristics of solar concentrators  
16 p04C9 A77-41906
- ELECTROPLATING**  
Disposal of toxic wastes. I - Electroplating and  
electrochemical machining wastes. II - Poisonous  
and radioactive wastes  
15 p0305 A77-36608
- ELECTROSTATIC CHARGE**  
Electrostatic energy storage  
[ORNL-TN-5529]  
15 p0364 N77-24598
- ELECTROSTATIC PRECIPITATORS**  
Energy reduction in cleaning exhausts containing  
particulates and noxious gases  
16 p0414 A77-42740  
Electrostatic precipitator design for western coals  
16 p0504 A77-51148  
Air pollution control for industrial coal-fired  
boilers  
16 p0504 A77-51152
- ELECTROSTATICS**  
Electrostatic properties of JP-5 jet fuel from  
alternate sources  
[AD-A025684]  
13 p0103 N77-12232
- ELLIPSONETERS**  
Ellipsometry in the study of selective  
radiation-absorbing surfaces --- for solar energy  
16 p0406 A77-41581
- EMERGENCIES**  
Emergency power plant of rapid availability for  
the Berlin-Tegel airport  
13 p0001 A77-10324  
Proposed energy conservation contingency plan:  
Emergency heating, cooling and hot water  
restrictions. Economic impact analysis.  
Environmental impact assessment  
[PB-258624/6]  
14 p0217 N77-18584
- EMITTANCE**  
Study of emittance distribution along the walls of  
a cellular low-loss cell in the case of a base  
surface with arbitrary emission indicatrix  
13 p0069 A77-18495
- ENCAPSULATING**  
Encapsulation of solar cell modules  
13 p0076 A77-19092  
Consideration of encapsulants for photovoltaic  
arrays in terrestrial applications  
14 p0203 A77-29580  
Review of world experience and properties of  
materials for encapsulation of terrestrial  
photovoltaic arrays  
[NASA-CR-149451]  
13 p0106 N77-12524  
Solar energy subsystems employing isothermal heat  
sink materials  
[PB-258738/4]  
14 p0233 N77-20616  
Investigation of test methods, material properties  
and processes for solar cell encapsulants  
[NASA-CR-155158]  
16 p0550 N77-33347
- ENERGY**  
Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 13: Phosphoric acid industry report  
[PB-264279/1]  
15 p0385 N77-26690
- ENERGY ABSORPTION**  
Progress in development and application of  
selective surfaces --- for solar collectors  
13 p0072 A77-19052  
Temperature optimization for power production of  
infinite heat transfer solar absorbers  
13 p0073 A77-19055  
Absorption cycles for air-cooled solar air  
conditioning  
14 p0168 A77-23447  
Study of an absorption solar refrigeration unit  
functioning on a round-the-clock basis  
15 p0316 A77-37772
- Investigation of solar absorption cooler for  
round-the-clock operation  
16 p0437 A77-47428  
Parametric study of a dynamic solar powered  
absorption cycle  
16 p0475 A77-48961
- ENERGY ABSORPTION FILMS**  
Plastics for solar-energy collectors. II - Typical  
operational data and model parameters,  
functional diagrams, optimization of layer  
thicknesses  
13 p0009 A77-11269  
Photovoltaic conversion of solar energy  
13 p0058 A77-16368  
Contribution to the study of solar energy  
collectors - Selective plates and cells  
13 p0072 A77-19051  
Indoor test methods to determine the effect of  
vacuum on the performance of a tubular flat  
plate collector --- for solar energy conversion  
[ASME PAPER 76-WA/SOL-24]  
14 p0190 A77-26529  
Plastics in systems of solar technology - A survey  
14 p0197 A77-28677  
The selectivity of absorbing layers --- of solar  
collector materials  
14 p0202 A77-29565  
Wavelength-selective surfaces for solar energy  
utilization  
14 p0204 A77-29583  
A comparison of solar photothermal coatings  
14 p0204 A77-29584  
Improved black nickel coatings for flat plate  
solar collectors  
14 p0204 A77-29585  
Applications of thin graded-index films to solar  
absorbers  
15 p0260 A77-31244  
Selective black absorbers using RF-sputtered  
Cr2O3/Cr cermet films  
15 p0265 A77-31951  
Novel development for economic solar-energy  
utilization  
15 p0268 A77-32402  
Spectral reflectance of TiN/x/ and ZrN/x/ films as  
selective solar absorbers  
16 p0423 A77-44492  
The Alcoa 655 selective surface for aluminum ---  
for solar collectors  
16 p0487 A77-49063  
Analytical and experimental treatment of a  
spray-on selective coating - Application to  
collector design  
16 p0487 A77-49064  
Solar energy utilization, solid state science, and  
a high efficiency amorphous-silicon absorber  
16 p0487 A77-49065  
The financial incentives for the fabrication of  
improved absorption coatings for the flat plate  
collector  
16 p0487 A77-49066  
Considerations in the development of a high  
performance per unit cost solar collector  
16 p0487 A77-49067  
Use of getters in evacuated solar collectors  
16 p0487 A77-49069  
The weatherability of solar energy utilization  
materials - Preliminary discussions  
16 p0487 A77-49070  
Heat mirror - A practical alternative to the  
selective absorber  
16 p0488 A77-49075  
Fundamental studies of black chrome for solar  
collector use  
16 p0498 A77-49160  
Cadmium stannate selective optical films for solar  
energy applications  
[PB-254879/0]  
13 p0090 N77-10678  
Development of a new silicon Schottky photovoltaic  
energy converter  
[PB-262491/4]  
15 p0373 N77-25654
- ENERGY BANDS**  
Fundamental electronic mechanisms limiting the  
performance of solar cells  
15 p0257 A77-30710  
Upper limit of efficiency for photovoltaic solar  
cells  
16 p0399 A77-40568

# ENERGY BUDGETS

# SUBJECT INDEX

## ENERGY BUDGETS

Characteristic aspects of the evolution of the French electric balance in 1975 13 p0012 A77-11340

Solar energy as contribution to the energy budget - Problems of storage 15 p0336 A77-39986

Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern France 16 p0417 A77-42963

Predicting the rate of warming of rivers below hydroelectric installations 16 p0437 A77-47749

## ENERGY CONSERVATION

The energy problem and the earth's fuel situation 13 p0004 A77-11027

Energy consumption and conservation in the United States 13 p0005 A77-11028

Total energy systems --- electric power generation with heat recovery 13 p0006 A77-11042

Optimal thermal insulation as an investment-computational problem 13 p0009 A77-11268

Air cleanup and energy management 13 p0010 A77-11302

Electricity and heat production - Energy efficiency versus cost efficiency 13 p0011 A77-11338

Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/ 13 p0013 A77-11524

Air transportation energy efficiency - Alternatives and implications [SAWE PAPER 1124] 13 p0016 A77-12192

Baseline test data for the EVA electric vehicle --- low energy consumption automobiles 13 p0025 A77-12704

Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708

Energy conservation with advanced power generating systems 13 p0026 A77-12723

Energy conservation potential of Modular Integrater Utility Systems /MIUS/ 13 p0026 A77-12724

Diversification as an energy conservation strategy 13 p0027 A77-12725

Industrial energy conservation through integration of thermal energy storage into process energy dynamics 13 p0028 A77-12733

An advanced energy conservation technology program; Proceedings of the Intersociety Workshop Conference, Airlie House, Va., March 24-26, 1976 13 p0045 A77-12928

Evolution of the concept of the automobile from the standpoint of saving energy 13 p0051 A77-14562

Energy recovery in railway and road transportation 13 p0051 A77-14564

Energy and environmental impacts of materials alternatives - An assessment of quantitative understanding 13 p0070 A77-18738

Improved use of energy --- through waste and solar energy utilization 13 p0079 A77-19123

Commuter van programs - An assessment 14 p0137 A77-20391

Electric load management and energy conservation 14 p0137 A77-20685

Energy - An emerging role for aerospace 14 p0166 A77-23363

New requirements for the development and design of thermal power systems 14 p0167 A77-23407

Solar energy retrofit for existing buildings 14 p0168 A77-23444

The potential for fuel conservation 14 p0178 A77-24960

Basis for developing a solar energy inventory 14 p0179 A77-25360

Electricity and the energy 'gap' 14 p0195 A77-27890

New life for old garbage - Resource and energy recovery from solid wastes 14 p0199 A77-29096

Application of gravitational energy exchange to tracked urban transit systems 14 p0200 A77-29468

Optimal unit commitment --- electric power system operating mode for cost reduction 15 p0260 A77-30812

The law for saving energy and its significance for energy politics 15 p0261 A77-31312

Energy savings by application of knowledge of building physics. I - Wall permeability and its significance for the atmospheric conditions in the building interior, the design and the thermal characteristics of windows, problems concerning the permeability of the joints 15 p0261 A77-31373

Economy of tap water heating in summer by means of solar energy 15 p0261 A77-31374

Efficient energy utilization 15 p0264 A77-31578

Ways of improving fuel utilization in industry 15 p0265 A77-31935

Industry can save energy without stunting its growth 15 p0267 A77-32209

Energy from wastes 15 p0272 A77-33280

Automotive fuel-saving system with on-board hydrogen generation and injection into I. C. engines 15 p0280 A77-33384

Cut energy costs: A guide for buying and plant operation --- industrial energy saving techniques 15 p0290 A77-34642

Energy and aerospace /Sixty-fifth Wilbur and Orville Wright Memorial Lecture/ --- aerospace contributions to energy conservation 15 p0304 A77-36434

Energy research overview - Alternatives for energy development [AAS 75-280] 15 p0304 A77-36555

Energy conservation and a healthy economy 15 p0305 A77-36612

Technologies lead to conservation --- in munition plants 15 p0305 A77-36634

Economic benefits of energy conservation 15 p0307 A77-36797

The auto option --- bus usage in urban areas 15 p0310 A77-36983

Running out of steam. III --- alternatives to internal combustion engine 15 p0310 A77-36984

Municipal solid waste as a resource for energy recovery and conservation 15 p0313 A77-37655

Thermolysis or electrolysis - Why we choose the latter --- water splitting for hydrogen production 15 p0321 A77-38528

Energy conservation in the investment policies of French firms. I - Formulation of the problem 15 p0324 A77-39504

Comparative energy policies of France, England, and Germany. II - Electricity and nuclear energy 15 p0324 A77-39505

Technical and economic aspects of industrial power-heat coupling. I 15 p0334 A77-39674

The NASA Energy Conservation Program [AIAA PAPER 77-1005] 16 p0405 A77-41571

Energy conservation by symbiosis 16 p0408 A77-41852

Fundamentals of solar-energy survey development 16 p0409 A77-41910

Thermal storage - It saves and saves and saves --- energy conservation 16 p0415 A77-42741

Evaluation of energy policy 16 p0415 A77-42859

Future energy options, ethics and a case for conservation 16 p0415 A77-42860

The heat pump - An approach for saving energy 16 p0421 A77-44450

Fuel conservation through airplane maintenance 16 p0427 A77-45925

## SUBJECT INDEX

## ENERGY CONSERVATION CONTD

- Energy savings obtained by applying the findings of construction physics. II 16 p0441 A77-48259
- Comparing alternative methods of improving fuel economy --- in automobiles 16 p0443 A77-48702
- Utilizing methane from coalbeds 16 p0444 A77-48710
- ERDA fuel cell programs 16 p0447 A77-48734
- Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743
- Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy 16 p0449 A77-48750
- Feasibility study of an Integrated Energy/Utility System at the University of Florida 16 p0449 A77-48751
- Energy savings through on-site fuel cells in industrial applications 16 p0449 A77-48752
- Heat pipes for hostile environments in energy conservation applications 16 p0450 A77-48758
- Improved systems for energy conversion and conservation as pollution control alternatives - USEPA program 16 p0451 A77-48771
- Fluidized-bed combustion of anthracite refuse 16 p0454 A77-48793
- Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831
- Solar heating for buildings in Ontario - Experience and analysis of single, multiple residential and commercial low rise buildings 16 p0476 A77-48975
- Energy conservation through residential solar retrofit 16 p0479 A77-48994
- A parametric study of critical fuel costs for solar heating in North America 16 p0493 A77-49118
- Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153
- Transportation energy conservation data book [ORNL-5198] 13 p0086 N77-10643
- Analysis of state solar energy options [PB-254730/5] 13 p0091 N77-10688
- Aircraft fuel conservation technology. Task force report, September 10, 1975 [NASA-TM-X-74295] 13 p0093 N77-11055
- Conference report: Energy Conservation in Transportation and Construction [PB-255657/5] 13 p0100 N77-11562
- Assessing the relationship between urban form and travel requirements: A literature review and conceptual framework [PB-254588/9] 13 p0102 N77-11923
- California energy outlook [UCRL-5196-REV-1] 13 p0106 N77-12525
- A study of inplant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255658/7] 13 p0115 N77-13542
- A study of inplant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255659/5] 13 p0115 N77-13543
- Bonneville power administration electric energy conservation study [PB-256766/7] 13 p0115 N77-13550
- Final assessment of the environmental impacts of the State Energy Conservation Program (Public law 94-163, Title III, part C, The Energy Policy and Conservation Act) [PB-256044/9] 13 p0116 N77-13555
- Research plan for achieving reduced automotive energy consumption [PB-255929/2] 13 p0121 N77-14495
- Second Environmental Aspects of Fuel Conversion Technology Symposium [PB-257182/6] 13 p0125 N77-14645
- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137926] 13 p0126 N77-15007
- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137927] 13 p0126 N77-15008
- Study of unconventional aircraft engines designed for low energy consumption [NASA-CR-135136] 13 p0127 N77-15043
- Effects of a thermal reactor on the energy efficiency of a turbocharged, stratified charge engine [AD-A026059] 13 p0128 N77-15409
- Integrating community utilities for resource conservation [PB-256898/8] 13 p0133 N77-15923
- Macro-economic impact and other considerations in selecting energy conservation measures [PB-257678/3] 14 p0208 N77-16454
- Potential for energy conservation technology transfer [CONF-760536-1] 14 p0211 N77-17573
- Proposed energy conservation contingency plan: Emergency heating, cooling and hot water restrictions. Economic impact analysis. Environmental impact assessment [PB-258624/6] 14 p0217 N77-18584
- Proceedings of the 3rd Annual Energy Conservation Management Conference [PB-258652/7] 14 p0218 N77-18594
- Changing energy perspectives [UCRL-78153] 14 p0223 N77-19626
- Composite fiber flywheel for energy storage [UCRL-78085] 14 p0225 N77-19645
- Application of a run around coil system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana [NASA-CR-149887] 14 p0229 N77-20561
- Batteries for utility load leveling [CONF-760469-3] 14 p0231 N77-20579
- Status of Goldstone solar energy system study of the first Goldstone energy project 14 p0235 N77-21126
- Assessment of fuel-conservation potential of a ground-transportation system due to full utilization of its mass transportation capabilities [PB-262125/8] 15 p0347 N77-22657
- Examination of the costs, benefits and energy conservation aspects of the NASA aircraft fuel conservation technology program [NASA-CR-152683] 15 p0352 N77-23007
- Energy management guide for light industry and commerce. EPIC energy management series [PB-263121/6] 15 p0356 N77-23616
- The potential for transit as an energy saving option [PB-263087/9] 15 p0359 N77-24019
- Fuel efficiency improvement in rail freight transportation: Multiple unit throttle control to conserve fuel [PB-262470/8] 15 p0366 N77-24629
- Report of the National Research Council Committee on Nuclear and Alternative Energy Systems [PB-263595/1] 15 p0367 N77-24633
- Role of the heat storage well future U.S. energy systems [PB-263480/6] 15 p0367 N77-24634
- Energy in Perspective: An orientation conference for educators [CONF-760677] 15 p0373 N77-25648
- Assessment of the potential for energy conservation through improved industrial boiler efficiency, volume 1 [PB-262576/2] 15 p0374 N77-25665
- Choosing an electrical energy future for the Pacific northwest: An alternative scenario [PB-264048/0] 15 p0375 N77-25674
- Regional land use and energy modeling [BNL-21809] 15 p0378 N77-26595
- New energy conservation ideas for existing and new buildings [CONF-750942-2] 15 p0382 N77-26660
- Bioconversion of agricultural wastes for pollution control and energy conservation [TID-27164] 15 p0383 N77-26675

## ENERGY CONSUMPTION

## SUBJECT INDEX

- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 2: Industry priority report  
[PB-264268/4] 15 p0383 N77-26679
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 3: Iron and steel industry report  
[PB-264269/2] 15 p0384 N77-26680
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 4: Petroleum refining industry report  
[PB-264270/0] 15 p0384 N77-26681
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 5: Pulp and paper industry report  
[PB-264271/8] 15 p0384 N77-26682
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 6: Olefins industry report  
[PB-264272/6] 15 p0384 N77-26683
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 7: Ammonia industry report  
[PB-264273/4] 15 p0384 N77-26684
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 8: Alumina/aluminum industry report  
[PB-264274/2] 15 p0384 N77-26685
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 9: Textile industry report  
[PB-264275/9] 15 p0384 N77-26686
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 10: Cement industry report  
[PB-264276/7] 15 p0384 N77-26687
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 14: Primary copper industry report  
[PB-264280/9] 15 p0385 N77-26691
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 15: Fertilizer industry report  
[PB-264281/7] 15 p0385 N77-26692
- The potential of lignocellulosic materials for the production of chemicals, fuels, and energy  
[PB-264458/1] 15 p0385 N77-26698
- Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- Nonbiological photochemical energy conversion, can it compete  
[SAND-76-5763] 15 p0393 N77-27541
- Quarterly report to US House and Senate Committees on Appropriations (3rd)  
[PB-265490/3] 16 p0517 N77-28616
- Energy fact book, 1977 --- energy sources, technology, and conservation  
[AD-A038802] 16 p0522 N77-29624
- The marketability of integrated energy/utility systems  
[PB-266042/1] 16 p0523 N77-29626
- Integrated utility systems: Feasibility study and conceptual design at the University of Florida  
[PB-266043/9] 16 p0523 N77-29627
- Integrated utility systems: Feasibility study and conceptual design at Central Michigan University  
[PB-266044/7] 16 p0523 N77-29628
- Energy conservation on campus. Volume 1: Guidelines  
[PB-266211/2] 16 p0524 N77-29636
- Energy conservation on campus. Volume 2: Case studies  
[PB-266212/0] 16 p0524 N77-29637
- The potential role of technological modifications and alternative fuels in alleviating Air Force energy problems  
[AD-A039597] 16 p0525 N77-30261
- US Navy energy R and D  
[AD-A039546] 16 p0529 N77-30623
- Savings in energy consumption by residential heat pumps: the effects of lower indoor temperatures and of night setback  
[ORNL-CO-4] 16 p0529 N77-30628
- National Research Council Committee on Nuclear and Alternative Energy Systems  
[TID-27435] 16 p0538 N77-31655
- Pacific northwest regional assessment program  
[BNWL-2084] 16 p0540 N77-31674
- Transportation Energy Conservation Data Book, supplement 2  
[ORNL-5247-SUPPL-2] 16 p0542 N77-32036
- An overview of concepts for aircraft drag reductions  
16 p0543 N77-32092
- Technical guidelines for energy conservation  
[AD-A041668] 16 p0546 N77-32596
- Workshop to Review FEA's 1976 National energy outlook  
[PB-268149/2] 16 p0547 N77-32601
- Energy management for Texas commerce and industry  
[PB-268409/0] 16 p0548 N77-32616
- Alternate petroleum based fuels for naval fleet usage: potential availability, cost, and system impact  
[AD-A041980] 16 p0551 N77-33372
- An approach for managing an energy conservation program  
[AD-A041086] 16 p0554 N77-33614
- US energy flow in 1976  
[UCID-17443] 16 p0557 N77-33639
- Analysis of the California energy industry  
[LBL-5928] 16 p0557 N77-33640
- Accounting systems for energy conservation  
[LA-6569-MS] 16 p0557 N77-33646
- Program plan for ERDA's participation in the IEA working party on energy conservation research and development  
[ERDA-77-57] 16 p0557 N77-33648
- Window design strategies to conserve energy  
[PB-269297/8] 16 p0559 N77-33669
- Energy policy decisionmaking, organization, and national energy goals  
[PB-269299/4] 16 p0559 N77-33671
- Building energy conservation programs: A preliminary examination of regulatory activities at the state level  
[PB-268873/7] 16 p0559 N77-33673
- Preliminary design study of a baseline M105  
[NASA-TM-X-58193] 16 p0561 N77-34050
- ENERGY CONSUMPTION**  
Energy consumption and conservation in the United States  
13 p0005 A77-11028
- Principles of energy analysis  
13 p0007 A77-11045
- The availability of fuels for power plants  
13 p0010 A77-11316
- Higher electric power use reduces energy consumption for same gross national product  
13 p0011 A77-11334
- Characteristic aspects of the evolution of the French electric balance in 1975  
13 p0012 A77-11340
- Energy in the household - Comparison of heating costs and prognosis concerning the consumption of energy until 1985  
13 p0015 A77-12059
- The significance of coal in the future energy picture  
13 p0018 A77-12247
- Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance  
13 p0020 A77-12657
- Small electric vehicle considerations in view of performance and energy usage  
13 p0024 A77-12698
- An analysis of electric vehicle mission, design, energy impact and cost  
13 p0024 A77-12700
- New concepts in solar photovoltaic electric power systems design  
13 p0038 A77-12817
- Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864
- Energy consumption in various modes of transportation  
13 p0050 A77-14561
- The energy crisis today - A perspective  
14 p0137 A77-20390
- Regression study of solar radiation and electrical energy consumption  
14 p0137 A77-20686



- The minimum combustion gas recirculation ratio for fuel gas conversion in a MHD cycle 14 p0157 A77-22552
- A comparison between the primary energy consumption of electric and gasoline powered vehicles 14 p0159 A77-22885
- Performance of an electric van fitted with a hydrodynamic torque converter transmission 14 p0160 A77-22897
- The case for alternative energy sources 15 p0262 A77-31469
- Energy demands: Modeling methods and techniques --- French book 15 p0264 A77-31595
- Use of a Lowry-type spatial allocation model in an urban transportation energy study 15 p0265 A77-31899
- Analysis of a Delphi study on hydrogen --- questionnaire survey on future energy utilization 15 p0284 A77-33411
- A comparison of residential and commercial energy use in the United States and Sweden 15 p0297 A77-36114
- A parametric analysis of the structure of international energy consumption 15 p0298 A77-36242
- Energy and the economy - An interrelated perspective 15 p0298 A77-36243
- Historical patterns of residential and commercial energy uses 15 p0298 A77-36244
- Toward establishing a national energy policy 15 p0307 A77-36767
- Ultimate consumption of fuel and energy in the nonindustrial sector 15 p0334 A77-39668
- Energy forecasts yesterday and today 16 p0400 A77-40683
- Energy resources available to man 16 p0402 A77-41422
- On strategies and fate --- energy and resources utilization 16 p0402 A77-41423
- Energy reduction in cleaning exhausts containing particulates and noxious gases 16 p0414 A77-42740
- Energy aspects of VTOL aircraft in comparison with other air and ground vehicles 16 p0419 A77-43333
- Solar energy in Australia 16 p0426 A77-45499
- Geography of energy production in France. V - The markets of consumption: The Paris region and the Lyon, Strasbourg and Bennes areas 16 p0427 A77-45712
- Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743
- Introductory remarks on space observations of long-term climatic changes produced by escalating energy use [IAF PAPER A-77-01] 16 p0507 A77-51508
- A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results [PB-252485/8] 13 p0088 A77-10662
- A linear economic model of fuel and energy in the United States. Volume 2: Submodels and data [PB-252486/6] 13 p0089 A77-10663
- Summary of EPA energy policy analysis [PB-253361/0] 13 p0089 A77-10669
- A simulation analysis of US energy demand, supply, and prices [PB-254314/8] 13 p0090 A77-10680
- Energy-economy relationships [PB-255171/1] 13 p0099 A77-11552
- Energy information activities at the FEA [PB-253962/5] 13 p0099 A77-11553
- Energy use in the contract construction industry [PB-245422/1] 13 p0099 A77-11557
- Review of energy forecasting methodologies and assumptions [PB-255170/3] 13 p0107 A77-12526
- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts east of the Mississippi [PB-255176/0] 13 p0112 A77-13229
- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts west of the Mississippi [PB-255177/8] 13 p0112 A77-13230
- Bonneville power administration electric energy conservation study [PB-256766/7] 13 p0115 A77-13550
- Energy consumption characteristics of transports using the prop-fan concept [NASA-CR-137937] 13 p0118 A77-14029
- Energy consumption characteristics of transports using the prop-fan concept: Summary report [NASA-CR-137938] 13 p0118 A77-14030
- Investment planning in the energy sector [LBL-4474] 13 p0125 A77-14948
- Hydrodynamic equilibrium conditions for AG(BH) main strut-pod foil system using flap incidence control [AD-A027521] 13 p0127 A77-15220
- Coal gasification commercial concepts: Gas cost guidelines [FE-1235-1] 13 p0130 A77-15500
- Possible effects of nuclear initiative on supply and use of electricity in California [AD-A026582] 13 p0131 A77-15510
- Electric energy usage and regional economic development [PB-257544/7] 14 p0208 A77-16449
- Proceedings of National Conference on Health, Environmental Effects, and Control Technology of Energy Use [PB-256845/9] 14 p0208 A77-16453
- Proposed energy conservation contingency plan: Emergency heating, cooling and hot water restrictions. Economic impact analysis. Environmental impact assessment [PB-258624/6] 14 p0217 A77-18584
- Regional energy system for the planning and optimization of national scenarios (RESPONS). Clean coal energy: Source-to-use economics project [ERDA-76-109] 14 p0222 A77-19602
- Residential energy use alternatives to the year 2000 [CONF-760648-1] 14 p0223 A77-19625
- Net energy analysis: An energy balance study of fossil fuel resources. Summary report [PB-259159/2] 14 p0225 A77-19658
- Summary report of technical discussion, NASA-ERDA solar energy proposal 14 p0229 A77-20562
- Engineering-economic model of residential energy use [ORNL-TM-5470] 14 p0231 A77-20580
- A western regional energy development study: Economics. Volume 1: SRI energy model results [PB-260835/4] 14 p0251 A77-21706
- Long-range forecasting properties of state-of-the-art models of demand for electric energy. Volume 2: Annotated bibliography [PB-261766/0] 14 p0251 A77-21718
- Strategic petroleum reserve plan (Public Law 94-163, section 154) [PB-261737/1] 15 p0342 A77-22591
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities) [PB-261150/7] 15 p0346 A77-22644
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement [PB-261153/1] 15 p0346 A77-22645
- California's energy future [AD-A032221] 15 p0348 A77-22667
- Report to congress by the Federal Aviation Administration on the energy efficiency of agency regulations [AD-A034611] 15 p0359 A77-24103
- Energy self-sufficiency prospects for the British Columbia forest products industry [VP-X-166] 15 p0363 A77-24591
- Alternative patterns of industrial energy consumption in the Northeast [BNL-50555] 15 p0364 A77-24597
- Fuels and energy data: United States by states and census divisions, 1973 [PB-262362/7] 15 p0367 A77-24636

- Future oil supply to the northeast United States  
[BNL-50557] 15 p0369 N77-24729
- Energy analysis handbook. CAC document 214  
[COO-2865-1] 15 p0372 N77-25635
- Choosing an electrical energy future for the  
Pacific northwest: An alternative scenario  
[PB-264048/0] 15 p0375 N77-25674
- Energy requirements for air pollution control in  
the primary aluminum industry  
[PB-264483/9] 15 p0375 N77-25684
- Techniques for the analysis of total energy and  
labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- Identifying and analyzing methods for reducing the  
energy consumption of helicopters  
[NASA-CR-144953A] 15 p0388 N77-27104
- Composite flywheel development  
[Y-2072] 15 p0388 N77-27194
- Energy management in residential and small  
commercial buildings  
[BNL-50576] 15 p0392 N77-27511
- Energy and US agriculture. 1974 data base, volume  
1. Part A: US series of energy tables. Part  
B: State series of energy tables  
[PB-264449/0] 15 p0395 N77-27562
- Energy consumption measurement: Data needs for  
public policy  
[PB-266039/7] 16 p0517 N77-28619
- Costs and energy efficiency of a dual-mode system  
[NASA-CR-154251] 16 p0518 N77-29003
- Project Independence Evaluation System (PIES)  
documentation. Volume 2: PIES econometric  
demand model  
[PB-265822/7] 16 p0519 N77-29327
- Energy utilization index method for predicting  
building energy use. Volume 2: Proposed  
supplement to TB ENG 529  
[AD-A040344] 16 p0521 N77-29608
- Energy conservation on campus. Volume 1: Guidelines  
[PB-266211/2] 16 p0524 N77-29636
- Savings in energy consumption by residential heat  
pumps: the effects of lower indoor temperatures  
and of night setback  
[ORNL-COM-4] 16 p0529 N77-30628
- Residential demand for energy, volume 1  
[EPRI-EA-235-VOL-1] 16 p0530 N77-30629
- Demonstration of building heating with a heat pump  
using thermal effluent  
[AD-A041024] 16 p0530 N77-30631
- Energy situation  
[PB-266836/6] 16 p0530 N77-30633
- Survey of the applications of solar thermal energy  
systems to industrial process heat. Volume 2:  
Industrial process heat survey  
[TID-27348-VOL-2] 16 p0537 N77-31639
- Energy Technologies for the West: Can the  
Individual's Voice be Heard? Public  
Participation in Energy Planning  
[TID-27433] 16 p0537 N77-31643
- Energy technologies for the West: General  
Session, volume 2  
[TID-27427] 16 p0538 N77-31646
- Energy Technologies for the West: Economic Growth  
and Energy  
[TID-27429] 16 p0538 N77-31648
- A user's guide to the MIT world energy demand data  
base. Part 2: Data index  
[PB-266630/9] 16 p0539 N77-31660
- Comparison of computer-predicted and observed  
energy uses in a multi-family high-rise  
apartment building  
[PB-267829/0] 16 p0539 N77-31665
- Technical guidelines for energy conservation  
[AD-A041668] 16 p0546 N77-32596
- Workshop to Review FEA's 1976 National energy  
outlook  
[PB-268149/2] 16 p0547 N77-32601
- An economic model of new crude oil and natural gas  
supplies in the lower 48 states  
16 p0552 N77-33596
- An approach for managing an energy conservation  
program  
[AD-A041086] 16 p0554 N77-33614
- US energy flow in 1976  
[UCID-17443] 16 p0557 N77-33639
- Improved engineering-economic model of residential  
energy use  
[ORNL-COM-8] 16 p0557 N77-33644
- Report of the Advisory Commission on Electric  
Power Alternatives  
[PB-268479/3] 16 p0559 N77-33668
- Energy statistics: A supplement to the summary of  
national transportation statistics  
[PB-269301/8] 16 p0559 N77-33672
- World energy supply and demand and the future of  
nuclear power  
[IAEA-CN-36/583] 16 p0560 N77-33680
- ENERGY CONVERSION**
- Aspects of energy conversion; Proceedings of the  
Summer School, Lincoln College, Oxford, England,  
July 14-25, 1975  
13 p0004 A77-11026
- Dutchess County, NY moves towards pyrolysis --- of  
solid wastes with fuel recovery  
13 p0010 A77-11298
- Intersociety Energy Conversion Engineering  
Conference, 11th, State Line, Nev., September  
12-17, 1976, Proceedings. Volumes 1 & 2  
13 p0020 A77-12662
- Transient performance characteristics of a high  
temperature distributed solar collector field  
13 p0037 A77-12810
- Fuel cells --- electrochemical energy conversion  
13 p0055 A77-15804
- The palirrhrotrophic origin of energy metabolism  
--- chemiosmotic precursor to phototropism in  
estuarine cellular organisms  
13 p0064 A77-17895
- Utilization of Western coal for MHD energy  
conversion  
14 p0140 A77-21230
- ECAS MHD system studies --- Energy Conversion  
Alternatives Study  
14 p0142 A77-21268
- Description of a new photoelectrochemical generator  
14 p0150 A77-21812
- Photovoltaic test and demonstration project ---  
residential energy program  
14 p0153 A77-21838
- Large scale Wind Energy Conversion System /WECS/  
design and installation as affected by site wind  
energy characteristics, grouping arrangement and  
social acceptance  
14 p0165 A77-23360
- Balancing power supply from wind energy converting  
systems  
14 p0166 A77-23361
- Thermionic energy conversion technology - Present  
and future  
[AIAA PAPER 77-500] 14 p0173 A77-23918
- Status of the NASA Space Power Program  
[AIAA PAPER 77-505] 14 p0173 A77-23922
- Generalized analysis of thermoelectric device  
configurations  
14 p0177 A77-24572
- The long term stability of magnetic liquids for  
energy conversion devices  
14 p0177 A77-24573
- Low cost dynamic energy conversion systems  
14 p0196 A77-28171
- Hydrodynamic basis of wave-energy converters of  
channel form  
15 p0267 A77-32211
- Oxidation-erosion of materials in high velocity  
hot gases  
15 p0270 A77-32604
- Titanium alloy hydrides - Their properties and  
applications  
15 p0280 A77-33385
- Improvements in fluid machines and systems for  
energy conversion. Volume 4 --- Book  
15 p0309 A77-36815
- Research needs report: Energy conversion research  
--- Book  
15 p0313 A77-37646
- Energy from solid waste utilization; Proceedings  
of the Sixth Annual Northeastern Regional  
Antipollution Conference on a New Source of  
Materials, Energy and Jobs - Solid Wastes  
Processing, University of Rhode Island,  
Kingston, R.I., July 8, 9, 1975  
16 p0433 A77-47210
- Economics of solid waste conversion  
16 p0433 A77-47211
- Potential alternative fuel derivatives from  
municipal solid wastes  
16 p0433 A77-47213

# SUBJECT INDEX

# ENERGY CONVERSION CONTD

- A supplementary fuel for power generation /Ames, Iowa/ --- solid waste recovery system  
16 p0433 A77-47214
- Modern incineration - A proven way for recovery of energy and metals  
16 p0434 A77-47220
- Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings. Volumes 1 & 2  
16 p0443 A77-48701
- Improved systems for energy conversion and conservation as pollution control alternatives - USEPA program  
16 p0451 A77-48771
- Environmental considerations in advanced energy conversion technology assessments  
16 p0452 A77-48777
- Environmental assessment of advanced energy conversion technologies  
16 p0452 A77-48778
- Terrestrial RTG designs featuring disc-shaped thermoelectric modules  
16 p0462 A77-48856
- Self sufficient energy integrated design and construction method for low cost-self help housing programs  
16 p0495 A77-49137
- Extraterrestrial resources and astronautics --- Russian book  
16 p0499 A77-49400
- Combined heat and electricity generation as a means for saving primary energy  
16 p0505 A77-51155
- Underground fuel gasification [UCRL-TRANS-10998]  
13 p0088 N77-10659
- Direct solar energy conversion for large scale terrestrial use --- using CdS/Cu<sub>2</sub>S solar cell [PB-252539/2]  
13 p0089 N77-10674
- Research on electrochemical energy conversion systems [AD-A023689]  
13 p0090 N77-10681
- Mathematical simulation and empirical determination of the aerchemical and thermal atmospheric pollution resulting from energy conversion processes [DLR-IB-553-75/1]  
13 p0091 N77-10700
- Methanol from coal fuel and other applications [ORAU-126]  
13 p0094 N77-11200
- Problems and solutions in the use of coal analyses [PB-0390-1]  
13 p0097 N77-11535
- Mechanical thermal motor [NASA-CASE-MFS-23062-1]  
13 p0104 N77-12402
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships [PB-255639/7]  
13 p0109 N77-12552
- Inventory of energy research and development (1973 - 1975), volume 1 [GPO-64-734-VOL-1]  
13 p0113 N77-13525
- Inventory of energy research and development (1973 - 1975), volume 4 [GPO-64-734-VOL-4]  
13 p0113 N77-13528
- A fermentation process for converting plant materials into methane  
13 p0121 N77-14583
- IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125]  
13 p0122 N77-14594
- Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle [AD-A026321]  
13 p0124 N77-14607
- Energy and Physics: General Conference of the European Physical Society [AD-A026962]  
13 p0131 N77-15511
- Surface research for development of new electrocatalysts for acid electrolyte fuel cells [AD-A026053]  
13 p0131 N77-15517
- Analysis of the technical and cost feasibility of solar and/or wind energy systems for Coast Guard public quarters [AD-A028332]  
14 p0209 N77-16460
- Feasibility of heating domestic hot water for apartments with solar energy [AD-A028418]  
14 p0209 N77-16461
- Application study of wind power technology to the city of Hart, Michigan [COO-2603-1]  
14 p0212 N77-17582
- Status of the ERDA/Sandia 17-metre Darrieus turbine design [SAND-76-5683]  
14 p0217 N77-18576
- Economic evaluation of mixture and pure fluid cycles in ocean thermal energy conversion systems [ORO-4918-8]  
14 p0217 N77-18578
- Ocean thermal energy conversion opportunities [BNWL-SA-5808]  
14 p0217 N77-18581
- Electrofluid dynamics energy conversion research [AD-A029066]  
14 p0218 N77-18593
- Hydrogen energy conversion --- for thermodynamic efficiency and cost effectiveness [AD-A030370]  
14 p0218 N77-18601
- Status report: Lawrence Livermore Laboratory wind energy studies [UCID-17157-1]  
14 p0221 N77-19588
- Relationship of energy growth to economic growth under alternative energy policies [BNL-50500]  
14 p0223 N77-19620
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [FE-2307-2]  
14 p0224 N77-19637
- Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations [AD-A031163]  
14 p0226 N77-19662
- Feasibility of meeting the energy needs of Army bases with self-generated fuels derived from solar energy plantations. Appendices A, B, and C [AD-A031164]  
14 p0226 N77-19663
- The 1985 technical coefficients for inputs to energy technologies [BNL-50532]  
14 p0231 N77-20583
- Microbial hydrogen production  
14 p0239 N77-21601
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen  
14 p0245 N77-21647
- Hydrogen energy: Its potential promises and problems  
14 p0246 N77-21648
- Preliminary research on ocean energy industrial complexes, phase 1 [ORO-4915-3]  
14 p0248 N77-21669
- Covered energy farms for solar energy conversion [LBL-4844]  
14 p0248 N77-21671
- Energy recovery from solid waste: A review of current technology [PB-260633/3]  
14 p0253 N77-22016
- Comparison of different wind energy conversion systems. Part 1: The NOAA system compared with the Ulrich HUTTER system [RFP-TRANS-204-PT-1]  
15 p0346 N77-22637
- The 10th International Power Sources Symposium [AD-A033323]  
15 p0347 N77-22656
- An optimization study of a low thermal potential power system [AD-A031709]  
15 p0348 N77-22666
- Solid waste as an energy source for the northeast [BNL-50559]  
15 p0352 N77-23012
- The 120-keV beam direct conversion system for TFTR injectors [UCRL-52137]  
15 p0355 N77-23610
- The use of geothermal energy at military installations [AD-A034241]  
15 p0366 N77-24626
- International Symposium on Wind Energy Systems [AD-A034871]  
15 p0366 N77-24627
- Research on electrochemical energy conversion systems [AD-A034454]  
15 p0367 N77-24632
- Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil [BNL-50538]  
15 p0369 N77-24998
- Projects to expand fuel sources in eastern states: Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976) [PB-262361/9]  
15 p0374 N77-25669
- Coal conversion: Description of technologies and necessary biomedical and environmental research [ORNL-5192]  
15 p0392 N77-27520
- Basic research on ceramic materials for energy storage and conversion systems [COO-2564-2]  
16 p0511 N77-28305

- Sampling strategy and characterization of  
Potential Emissions from Synfuel Production  
Symposium  
[CONF-760602] 16 p0515 N77-28603
- Energy programs at the Johns Hopkins University  
Applied Physics Laboratory  
[AD-A038096] 16 p0522 N77-29623
- Fluid dynamic energy conversion and transfer  
processes  
[AD-A04C589] 16 p0533 N77-31444
- Heat source component development program  
[BNI-X-676] 16 p0536 N77-31632
- Photovoltaic conversion program  
[ERDA-76-161] 16 p0538 N77-31653
- Low to high temperature energy conversion system  
[NASA-CASE-NPO-13510-1] 16 p0545 N77-32581
- Solar energy collection system  
[NASA-CASE-NPO-13810-1] 16 p0545 N77-32582
- High efficiency thermionic converter studies  
[NASA-CR-135263] 16 p0546 N77-32592
- An initial comparative assessment of orbital and  
terrestrial central power systems  
[NASA-CR-155042] 16 p0546 N77-32594
- The President's energy program  
[GPO-88-556] 16 p0552 N77-33599
- Solid polymer electrolyte (SPE) fuel cell  
technology program, phase 1/1A --- design and  
fabrication  
[NASA-CR-151506] 16 p0553 N77-33605
- Solid polymer electrolyte (SPE) fuel cell  
technology program, phase 2/2A --- testing and  
evaluations  
[NASA-CR-151507] 16 p0553 N77-33606
- Biological solar energy conversion: Approaches to  
overcome yield, stability and product limitations  
[PB-267937/1] 16 p0554 N77-33619
- ENERGY CONVERSION EFFICIENCY**
- Superflywheel energy storage and nonsynchronous  
AC/DC/AC electric transmission supplements power  
system operation 13 p0002 A77-10638
- On black solar cells or the tetrahedral texturing  
of a silicon surface 13 p0004 A77-11000
- Solar energy --- conversion technology assessment  
13 p0006 A77-11037
- Total energy systems --- electric power generation  
with heat recovery 13 p0006 A77-11042
- Environmental aspects of energy conversion and use  
13 p0006 A77-11044
- A multilayer iron-thiocyanine photogalvanic cell  
13 p0007 A77-11108
- CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica  
substrates 13 p0007 A77-11110
- Evaluation of coal liquefaction efficiency based  
on various ranks 13 p0009 A77-11244
- ERDA's gas turbine development program for the  
next decade 13 p0011 A77-11324
- The mysteries of nuclear programs --- energy  
conversion efficiency 13 p0011 A77-11337
- Electricity and heat production - Energy  
efficiency versus cost efficiency 13 p0011 A77-11338
- Reducing grain-boundary effects in polycrystalline  
silicon solar cells 13 p0014 A77-11761
- Some features of the operation of a solar  
installation acting as a low-temperature source  
of heat for a heat pump 13 p0015 A77-11924
- Near-uv photon efficiency in a TiO<sub>2</sub> electrode -  
Application to hydrogen production from solar  
energy 13 p0015 A77-11947
- Synthetic fuels - Prices, prospects, and prior art  
13 p0017 A77-12236
- A method of testing for rating solar collectors  
based on thermal performance 13 p0019 A77-12408
- Photoassisted electrolysis of water - Conversion  
of optical to chemical energy 13 p0021 A77-12666
- Energy conversion via photoelectrolysis  
13 p0021 A77-12667
- Solar energy collection by bioconversion  
13 p0021 A77-12672
- A conceptual design study of closed Brayton cycle  
gas turbines for fusion power generation  
13 p0022 A77-12676
- Electric vehicle performance with alternate  
batteries 13 p0025 A77-12707
- Electrochemical power and hydrogen generation from  
high temperature electrolytic cells 13 p0025 A77-12709
- Production of methane using offshore wind energy  
13 p0026 A77-12722
- Energy conservation with advanced power generating  
systems 13 p0026 A77-12723
- The economic generation of electricity from  
moderate temperature geothermal resources  
13 p0030 A77-12749
- Comparison of geothermal power conversion cycles  
13 p0030 A77-12750
- Power production from high temperature geothermal  
waters 13 p0030 A77-12751
- The potential of the heat pipe in coal  
gasification processes 13 p0031 A77-12763
- Thermionic topping for central station power plants  
13 p0034 A77-12787
- Thermionic topping of a steam power plant  
13 p0034 A77-12789
- Comparative performance of solar thermal power  
generation concepts 13 p0036 A77-12803
- Collector field optimization for a solar thermal  
electric power plant 13 p0038 A77-12811
- A fixed collector employing reversible vee-trough  
concentrator and a vacuum tube receiver for high  
temperature solar energy systems 13 p0038 A77-12813
- Transport theory of 3M high-performance  
thermoelectric materials 13 p0042 A77-12848
- The integral formulation of the thermoelectric  
figure-of-merit - Effects of lattice thermal  
conduction 13 p0042 A77-12850
- The low cost high performance generator /LCHPG/  
--- space Radioisotope Thermoelectric Generators  
13 p0042 A77-12855
- Advanced thermionic converter development  
13 p0043 A77-12862
- A new generation scheme for large wind energy  
conversion systems 13 p0043 A77-12868
- Wind driven field modulated generator systems  
13 p0044 A77-12869
- An advanced energy conservation technology  
program; Proceedings of the Intersociety  
Workshop Conference, Airlie House, Va., March  
24-26, 1976 13 p0045 A77-12928
- Stage efficiency in the analysis of thermochemical  
water decomposition processes 13 p0047 A77-13538
- New modes of operation for avalanche diodes -  
Frequency multiplication and upconversion  
13 p0049 A77-14261
- Thermodynamic analysis and selection of optimal  
parameters of a dynamic converter for a solar  
energy set-up --- utilizing Stirling engine  
13 p0051 A77-14580
- Effect of optical properties of a surface exposed  
to solar radiation on the radiation balance  
13 p0052 A77-14928
- Optimization of the geometry of switching buses  
for thermoelements in thermoelectric generators  
13 p0052 A77-14951
- Energy: Conversion and utilization --- Book  
13 p0052 A77-14957
- Shock tube for investigations of high-temperature  
MHD generators 13 p0054 A77-15665
- Investigation of two-phase liquid-metal  
magnetohydrodynamic power systems 13 p0057 A77-16212

Combined cycles and refined coal --- gasification plant using high temperature gas turbines 13 p0058 A77-16249

Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324

Geothermal energy as a source of electric power: Thermodynamic and economic design criteria --- Book 13 p0060 A77-16623

Theoretical maximum for energy from direct and diffuse sunlight 13 p0064 A77-17845

Radiation effects on high efficiency silicon solar cells 13 p0064 A77-18072

Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials 13 p0068 A77-18444

Axial conduction in a flat-plate solar collector 13 p0068 A77-18447

Use of Lexan and Kapton honeycombs to increase solar collector efficiency 13 p0068 A77-18448

Arrays of fixed flat-plate solar energy collectors - Performance comparisons for differing individual component orientations 13 p0068 A77-18449

The lensed high-voltage vertical multijunction solar cell 13 p0069 A77-18489

New analysis of a high-voltage vertical multijunction solar cell 13 p0069 A77-18490

Progress in development and application of selective surfaces --- for solar collectors 13 p0072 A77-19052

Temperature optimization for power production of infinite heat transfer solar absorbers 13 p0073 A77-19055

Procedure for characterizing flat plate solar collectors 13 p0073 A77-19056

Thermosole flat plate collectors 13 p0073 A77-19058

Solar water heater using hardened black polythene pipe absorbers 13 p0073 A77-19060

Periodically adjustable concentrators adapted to solar cell panels 13 p0074 A77-19068

An analysis of silicon solar cell parameters for terrestrial applications 13 p0076 A77-19081

Cuprous oxide Schottky photovoltaic cells as potential solar energy converters 13 p0076 A77-19088

Photovoltaic systems using sunlight concentration 13 p0076 A77-19089

Meeting electric power needs with photovoltaic power systems 13 p0076 A77-19091

Investigation of a TiO<sub>2</sub>/electrolyte solar cell and the photocatalytic water decomposition 13 p0077 A77-19094

Energy considerations in BHE power systems --- Heliohydroelectric and Helioelectrolytic systems 13 p0077 A77-19099

Efficiency tests on a linear parabolic concentrator for medium and high temperatures 13 p0077 A77-19103

Selection of optimal pan color for solar water heater 13 p0078 A77-19104

Factors affecting the use of solar energy for cooling 13 p0078 A77-19108

Application of solar heat to buildings in Austria 13 p0079 A77-19114

New frontiers in solar and other energy options 13 p0079 A77-19118

Pulsed energy conversion with a dc superconducting magnet 13 p0081 A77-19293

Ceramic thin film CdTe solar cell 14 p0135 A77-19635

Electron beam research at Sandia Laboratories, USA --- for inertial confinement fusion 14 p0138 A77-20706

Energy balance for anaerobic digestion 14 p0138 A77-20999

Response of a partially illuminated solar cell 14 p0139 A77-21025

A microwave energy converter with a reversing magnetic field 14 p0139 A77-21154

Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312

Tower-type solar energy plant - Configuration and energy efficiency of concentrator 14 p0143 A77-21314

The economic collection and efficient utilization of solar energy 14 p0147 A77-21778

Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells 14 p0147 A77-21781

Silicon solar cell development 14 p0148 A77-21784

Assessment of high-efficiency solar cells performance 14 p0148 A77-21785

High-efficiency thin silicon solar cells 14 p0148 A77-21786

A novel cover slide for solar cells 14 p0148 A77-21789

A solar collector of glass 14 p0148 A77-21792

A geometrical spectral selective window --- for conversion of solar energy into heat 14 p0148 A77-21793

Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system 14 p0149 A77-21795

Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell 14 p0149 A77-21797

Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions 14 p0149 A77-21801

Optimal parameters for solar cell films 14 p0150 A77-21805

Focusing collectors of solar radiation 14 p0150 A77-21808

Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815

Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818

Calculation of the efficiency of a heterojunction solar cell 14 p0151 A77-21821

Utilization of solar radiation in large solar power plants with hydraulic storage 14 p0152 A77-21827

A study on solar tower power system 14 p0152 A77-21832

Thermal energy of oceans 14 p0153 A77-21833

Status report on the German experimental study for terrestrial solar electric generators 14 p0153 A77-21836

Thermoelectric conversion of solar energy by means of refractory B14Si compounds 14 p0154 A77-21848

Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975 14 p0154 A77-21850

Does solar energy demand more land surface, and more materials or energy investment than nuclear energy or fossil fuels - A preliminary study 14 p0155 A77-21857

Optimum wind-energy conversion systems 14 p0155 A77-21936

Small gas turbines and the Total Energy concept 14 p0156 A77-22024

Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038

Analysis of silicon solar cells with stripe geometry junctions 14 p0156 A77-22079

- High efficiency n-CdS/p-InF solar cells prepared by the close-spaced technique 14 p0156 A77-22081
- Principal stages in the development of thermoelectric power in the USSR 14 p0156 A77-22123
- Simulation of wind turbine generator system power flow dynamics 14 p0158 A77-22650
- Tunnel MIS solar cells 14 p0163 A77-22979
- A possible saturation criterion for wind energy extraction 14 p0165 A77-23359
- Improved theory of the silicon p-n junction solar cell 14 p0166 A77-23364
- A practical solar concentrator 14 p0171 A77-23657
- Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0171 A77-23720
- Hardened solar photovoltaics [AIAA PAPER 77-484] 14 p0172 A77-23904
- Advanced vertical-junction silicon solar cells [AIAA PAPER 77-486] 14 p0172 A77-23906
- Gallium arsenide concentrator system [AIAA PAPER 77-487] 14 p0172 A77-23907
- Advanced high efficiency wraparound contact solar cell [AIAA PAPER 77-521] 14 p0174 A77-23934
- Fuels via bioconversion 14 p0176 A77-24569
- Review - Silicon solar cells for terrestrial applications 14 p0178 A77-25085
- Net energy delivery from geothermal resources 14 p0178 A77-25137
- Experimental facility for measuring spatial and energy characteristics of solar concentrators 14 p0179 A77-25356
- Design considerations for high-intensity solar cells 14 p0179 A77-25591
- Cost optimal deployment of mirrors associated with a high temperature solar energy system 14 p0181 A77-25901
- The advantages of sun tracking for planar silicon solar cells 14 p0181 A77-25904
- Solar-optical analyses of a mass-produced plastic circular Fresnel lens 14 p0181 A77-25906
- Reduction of grain boundary recombination in polycrystalline silicon solar cells 14 p0181 A77-25999
- Optimal overall efficiency for a solar radiation collector utilizing a two fluid Rankine Cycle to generate electrical power 14 p0182 A77-26056
- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House 14 p0182 A77-26058
- Windmill optimization 14 p0183 A77-26086
- A method for increasing the efficiency of the electric generating process 14 p0183 A77-26087
- Coal gasifier projects gather momentum 14 p0184 A77-26290
- Status of silicon solar cell technology 14 p0184 A77-26392
- Double-exposure collectors with mirrors for solar-heating systems [ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476
- Performance of flat-plate collectors with planar reflectors [ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478
- Heat pipes in flat plate solar collectors [ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517
- Solar heating and cooling and energy conservation potentials for commercial buildings [ASME PAPER 76-WA/SOL-17] 14 p0189 A77-26522
- Optimal mass flow rates through flat plate solar collector panels [ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524
- Indoor test methods to determine the effect of vacuum on the performance of a tubular flat plate collector --- for solar energy conversion [ASME PAPER 76-WA/SOL-24] 14 p0190 A77-26529
- Research and development of cryoalternators for large-electrical power systems 14 p0190 A77-26536
- PULSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544
- Hydrocarbon fuel conditioner for a 1.5 kW fuel cell power plant 14 p0195 A77-28168
- Solar collectors - Technology and principles of operation 14 p0197 A77-28676
- The physical principles of photoelectric conversion 14 p0202 A77-29568
- The consideration of climatic data in the prediction of solar-system performance --- for energy conversion 14 p0202 A77-29569
- Energy considerations related to the acquisition, supply, and utilization of solar energy 14 p0203 A77-29572
- Energy-direct-conversion in solar technology 14 p0203 A77-29574
- Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber 14 p0204 A77-29594
- Experimental investigation of energy conversion efficiency during the interaction of a conducting-fluid piston with a magnetic field 14 p0204 A77-29618
- Thermal efficiency of geothermal power 14 p0205 A77-29788
- Design application of the Hottel-Whillier-Bliss equation --- for flat-plate solar collector heat testing 15 p0255 A77-30309
- Dimensioning of the solar heating system in the Zero Energy House in Denmark 15 p0256 A77-30319
- An isothermal etchback-regrowth method for high-efficiency Ga<sub>1-x</sub>Al<sub>x</sub>/As-GaAs solar cells 15 p0257 A77-30372
- Energy investment in nuclear and solar power plants 15 p0257 A77-30599
- Fundamental electronic mechanisms limiting the performance of solar cells 15 p0257 A77-30710
- Performance limitations of silicon solar cells 15 p0257 A77-30711
- Optimization of silicon solar cell design for use under concentrated sunlight 15 p0257 A77-30714
- Electronic properties of amorphous silicon in solar cell operation 15 p0257 A77-30717
- Efficiency calculations for Al<sub>x</sub>Ga<sub>1-x</sub>/As-GaAs heteroface solar cells 15 p0257 A77-30720
- Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell 15 p0258 A77-30721
- Collection efficiency of heterojunction solar cells 15 p0258 A77-30722
- Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723
- Performance of n<sup>+</sup>/p silicon solar cells in concentrated sunlight 15 p0258 A77-30729
- Silicon solar cells on unidirectionally recrystallized metallurgical silicon 15 p0258 A77-30731
- Fabrication and characterization of thin-film silicon solar cells on alumina ceramic 15 p0258 A77-30732
- Amorphous silicon solar cells 15 p0259 A77-30733
- Indium-tin-oxide-silicon heterojunction photovoltaic devices 15 p0259 A77-30735
- Large-area high-efficiency AlGa/As-GaAs solar cells 15 p0259 A77-30738
- InP-CdS solar cells 15 p0259 A77-30740

- Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741
- Solar-thermal energy systems 15 p0262 A77-31472
- The French CNRS 1000 kW solar furnace - Description, performance characteristics, present utilization, and perspectives 15 p0262 A77-31473
- Thermal accumulators --- latent heat storage system design 15 p0264 A77-31673
- Spectral response and efficiency relations in semiconductor liquid junction solar cells 15 p0264 A77-31823
- Theory of the Schottky barrier solar cell 15 p0266 A77-32116
- High level concentration of sunlight on silicon solar cells 15 p0267 A77-32208
- Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process 15 p0267 A77-32247
- Investigation of a coaxial explosion-type MHD generator 15 p0268 A77-32313
- Energy from bio-conversion for developing countries 15 p0270 A77-32592
- The manufacture of hydrogen from coal 15 p0275 A77-33337
- The K-T process - Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 15 p0275 A77-33338
- Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344
- Laboratory investigations on thermochemical hydrogen production 15 p0276 A77-33348
- Recent developments of large electrolytic hydrogen generators 15 p0277 A77-33358
- Water electrolysis under pressure - Improvement of energy efficiency by temperature increase 15 p0277 A77-33360
- Performance characteristics of a high-pressure, moderate temperature, electrolysis system --- for hydrogen-based energy storage 15 p0277 A77-33361
- Feasibility of hydrogen production by direct water splitting at high temperature 15 p0279 A77-33372
- Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions 15 p0286 A77-33435
- Studies on the energy system of Hokkaido. I - First attempt: Model-I. II - Various data and their basis. III - Simulations by Model-I 15 p0287 A77-33526
- Factors which maximize the efficiency of Cr-p-Si Schottky /MIS/ solar cells 15 p0288 A77-34103
- Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser 15 p0289 A77-34221
- Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant --- utilizing Stirling engine 15 p0291 A77-34974
- Solar energy, its conversion and utilization 15 p0294 A77-35316
- A simple model for solar energy economics in the U.K 15 p0298 A77-36245
- Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344
- Electrochemical energy conversion. I - Electric vehicle propulsion 15 p0303 A77-36410
- Solar collection systems - The rationale 15 p0304 A77-36426
- 100 MWe solar power plant design configuration and performance [AAS 75-288] 15 p0305 A77-36556
- Active solar-heating systems for houses 15 p0306 A77-36724
- Gasification and generation of electricity --- coal utilization 15 p0308 A77-36812
- What price wind power --- wind turbine efficiencies 15 p0310 A77-37248
- Limiting values of the energy generated by pulsed MHD-converters 15 p0316 A77-37929
- Conceptual design of a parabolic dish solar collector using simulation techniques 15 p0318 A77-38211
- Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells 15 p0320 A77-38367
- OPTIMO - A method for process evaluation applied to the thermochemical decomposition of water 15 p0320 A77-38526
- Thermolysis or electrolysis - Why we choose the latter --- water splitting for hydrogen production 15 p0321 A77-38528
- The rate of mass transfer in a solar regenerator 15 p0323 A77-39109
- Flywheel energy storage. II - Magnetically suspended superflywheel 15 p0323 A77-39315
- Heat mirrored solar energy receivers [AIAA PAPER 77-728] 15 p0324 A77-39506
- The disk geometry applied to open cycle MHD power generation - Experiments and theoretical considerations 15 p0325 A77-39531
- Part-load performance and voltage-current characteristics of a base load MHD generator 15 p0332 A77-39573
- Coal fired non-equilibrium closed cycle MHD power plant system since ECAS --- Energy Conversion Alternatives Study 15 p0332 A77-39576
- Meteorological effects on solar cells 15 p0338 A77-40149
- Upper limit of efficiency for photovoltaic solar cells 16 p0399 A77-40568
- Photovoltaic energy conversion using concentrated sunlight 16 p0402 A77-41516
- Gas turbine HTGR - A total energy utilization option --- High Temperature Gas-cooled Reactor [AIAA 77-1016] 16 p0403 A77-41560
- Implementation issues of wind energy --- cost analysis [AIAA 77-1025] 16 p0404 A77-41565
- Cost studies on terrestrial photovoltaic power systems with sunlight concentration 16 p0405 A77-41579
- The effect of design and operating parameters on the performance of flat plate solar collectors - Calculation method and detailed appraisal 16 p0406 A77-41580
- The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583
- A comparison of GaAs and Si hybrid solar power systems 16 p0406 A77-41584
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587
- Minor radius compression experiments --- for ohmic heating efficiency improvement in Tokamaks 16 p0407 A77-41683
- Study of the feasibility of exploiting the galloping phenomenon as energy source 16 p0407 A77-41722
- Solar ponds - Low cost solar energy management systems 16 p0408 A77-41851
- Investigation of energy parameters of low-temperature ring thermopiles 16 p0409 A77-41902
- Experimental setup for measuring space and energy characteristics of solar concentrators 16 p0409 A77-41906

- Variable speed wind turbines for high wind energy conversions 16 p0410 A77-42074
- Hybrid simulation of fuel cell power conversion systems 16 p0414 A77-42636
- The aircraft energy efficiency active controls technology program [AIAA 77-1076] 16 p0415 A77-42784
- Radiation effects on high efficiency silicon solar cells --- for spacecraft application 16 p0416 A77-42892
- Study of thermal performance of solar heating systems with storage and auxiliary heaters 16 p0417 A77-42957
- A tubular evacuated solar collector utilizing a heat pipe as absorber 16 p0417 A77-42961
- Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors 16 p0418 A77-43049
- Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator 16 p0418 A77-43070
- On the performance of cylindrical parabolic solar concentrators with flat absorbers 16 p0422 A77-44484
- Efficient, low cost, concentrating solar collectors 16 p0423 A77-44486
- Comparison of predicted performance of constant outlet temperature and constant mass flow rate collectors --- for solar energy conversion 16 p0423 A77-44489
- GaAs double-heterostructure photodetectors --- solar cell design 16 p0426 A77-45304
- Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia 16 p0427 A77-45548
- Domestic hot water and solar energy in Ireland 16 p0430 A77-46608
- Advanced fuel nuclear reaction feasibility using laser compression. I 16 p0435 A77-47358
- Generalized criterion for controlled fusion 16 p0436 A77-47368
- Unified criterion for proximity to controlled fusion 16 p0436 A77-47369
- Degradation of solar cell efficiency by sheet resistance 16 p0438 A77-47854
- ERDA/PEWA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology 16 p0446 A77-48721
- Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723
- The zinc-bromine battery - Possible candidate for electric vehicles and load leveling 16 p0446 A77-48725
- Rechargeability studies of ambient temperature lithium/sulfur batteries 16 p0447 A77-48729
- ERDA fuel cell programs 16 p0447 A77-48734
- Geothermal well stimulation with a secondary fluid 16 p0454 A77-48795
- Energy extraction characteristics of hot dry rock geothermal systems 16 p0455 A77-48798
- A comparison of three working fluids for the design of geothermal power plants 16 p0455 A77-48800
- Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California --- in geothermal resources exploitation 16 p0455 A77-48801
- The use of mixture working fluids in geothermal binary power cycles 16 p0455 A77-48802
- A two-phase rotary separator demonstration system for geothermal energy conversion 16 p0456 A77-48807
- Electron beam heated solenoid reactors for fusion power and fissile fuel breedings 16 p0459 A77-48827
- Combined diesel-organic Rankine-cycle power plant 16 p0459 A77-48830
- Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835
- Solar cell array for concentrated sunlight 16 p0460 A77-48836
- Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- Dynamic modeling and sensitivity analysis of solar thermal energy conversion systems 16 p0461 A77-48845
- 1 MWh solar cavity steam generator solar test program 16 p0461 A77-48846
- Deterministic insolation estimates for solar total energy systems 16 p0462 A77-48847
- Design of a spherical RTG --- Radioisotope Thermoelectric Generators 16 p0462 A77-48857
- Demonstration of a Free-Piston Stirling Linear Alternator power conversion system 16 p0465 A77-48880
- Recent Canadian activities in biomass 16 p0470 A77-48917
- The climatology of available solar energy for Canada 16 p0471 A77-48924
- The use of planar reflectors for increasing the energy yield of flat-plate collectors 16 p0472 A77-48937
- A method of comparing flat-plate air and liquid solar collectors for use in space heating applications 16 p0472 A77-48941
- Design considerations for parabolic-cylindrical solar collectors 16 p0473 A77-48950
- Comparative performance of solar heating with air and liquid systems 16 p0475 A77-48967
- Experimental evaluation of a solar house heating system in Quebec 16 p0475 A77-48968
- Solar heating in northern New England 16 p0477 A77-48980
- Solar thermal system requirements 16 p0481 A77-49017
- Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications 16 p0483 A77-49031
- Fermi function model absorption profile for solar-thermal conversion 16 p0483 A77-49035
- Terrestrial concentrating photovoltaic power system studies 16 p0486 A77-49058
- Basic mechanisms governing solar-cell efficiency 16 p0486 A77-49060
- CuInSe<sub>2</sub>/CdS thin film solar cells 16 p0486 A77-49062
- Considerations in the development of a high performance per unit cost solar collector 16 p0487 A77-49067
- On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices 16 p0488 A77-49073
- Wind-electric conversion utilizing field modulated generator systems 16 p0489 A77-49087
- Application of chemical engineering to large scale solar energy 16 p0491 A77-49098
- An assessment of hydrogen as a means to store solar energy 16 p0492 A77-49107
- The performance of homemade solar collectors at the Stockton State College 'Energy House' 16 p0497 A77-49151
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161



- Performance correlations of five solar collectors tested simultaneously outdoors 16 p0498 A77-49162
- Solar energy conversion with fluorescent collectors 16 p0499 A77-49166
- Model calculations for metal-insulator-semiconductor solar cells 16 p0500 A77-50050
- On power-generating thermojunctions with radial flow of current --- for solar energy conversion 16 p0500 A77-50202
- Hydrogen quantum yields in the 360 nm photolysis of  $\text{Eu}^{2+}$  solutions and their relationship to photochemical fuel formation 16 p0501 A77-50203
- Heat transfer analysis of a flat-plate solar energy collector 16 p0501 A77-50207
- Enhancement of diffusion length in EPG ribbon solar cells under illumination --- Edge-defined Film-fed Growth 16 p0503 A77-50293
- Assuring the performance of fossil energy programs 16 p0503 A77-50499
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator [NASA-TM-X-73520] 13 p0097 N77-11530
- Solid Polymer Electrolyte (SPE) fuel cell technology, program review, phase 2 [NASA-CR-150957] 13 p0097 N77-11532
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships [PB-255639/7] 13 p0109 N77-12552
- Standardized performance tests of collectors of solar thermal energy - A flat-plate copper collector with parallel nylon striping [NASA-TM-X-73553] 13 p0114 N77-13535
- Experimental study of the theoretical and technological possibilities to manufacture solar cells using GaAs-layers on GaAs-structures [BNFT-PE-W-76-10] 14 p0212 N77-17584
- Recovery of inaccessible coal reserves by in situ gasification [CONF-760906-5] 14 p0224 N77-19636
- Practical reasons for investigating ion transport in high temperature insulating materials --- for energy conversion efficiency [CONF-760831-2] 14 p0227 N77-19935
- Water electrolysis under pressure: Improvement of energy efficiency by temperature increase 14 p0238 N77-21594
- A thermodynamic analysis of H<sub>2</sub>SO<sub>4</sub>, a hydrogen conversion and storage system 14 p0242 N77-21622
- Design techniques for modular integrated utility systems --- energy production and conversion efficiency [NASA-TM-X-58189] 14 p0253 N77-22005
- Sensitivity of solar-cell performance to atmospheric variables. 1: Single cell [NASA-CP-2010] 15 p0378 N77-26623
- Sensitivity of solar-cell performance to atmospheric variables. 2: Dissimilar cells at several locations [NASA-CP-2010] 15 p0379 N77-26624
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 1: Summary and combined gas-steam turbine plant with an integrated low-BTU gasifier [NASA-CR-134942-VOL-1] 15 p0379 N77-26628
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 2: Summary and combined gas-steam turbine plant using coal derived liquid fuel [NASA-CR-134942-VOL-2] 15 p0379 N77-26629
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 3: Summary and advanced steam plant with pressurized fluidized bed boilers [NASA-CR-134942-VOL-3] 15 p0379 N77-26630
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary [NASA-CR-134949-VOL-1] 15 p0379 N77-26631
- Energy Conversion Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach [NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles [NASA-CR-134949-VOL-2-PT-2] 15 p0379 N77-26633
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 3: Open cycle gas turbines and open cycle MHD [NASA-CR-134949-VOL-2-PT-3] 15 p0379 N77-26634
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results [NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment [NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment [NASA-CR-134955] 15 p0380 N77-26637
- Effects of spectral variations on silicon cell output [SAND-76-9142] 15 p0381 N77-26653
- Evaluation of phase 2 conceptual designs and implementation assessment resulting from the Energy Conversion Alternatives Study (ECAS) --- coal utilization in electric power generation [NASA-TM-73515] 16 p0527 N77-30598
- Installation in Dakar of a pump powered by solar cell panels 16 p0546 N77-32589
- Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature [NASA-CR-155166] 16 p0553 N77-33604
- ENERGY DISSIPATION**
- Thermal analysis of some flat-plate solar collector designs for improving performance [AIAA PAPER 77-727] 15 p0311 A77-37252
- Studies into reduction of radiative heat losses of flat plate solar collectors 16 p0417 A77-42962
- A generalized numerical model for predicting energy transfers and performance of large solar ponds 16 p0482 A77-49025
- On pressure-work, viscous dissipation and the energy balance relation for geothermal reservoirs 16 p0505 A77-51256
- ENERGY DISTRIBUTION**
- Radiant-vector distribution in the radiant field of a parabolocylindric concentrator 13 p0015 A77-11920
- Power resource estimate of ocean surface waves 13 p0071 A77-18790
- Technical prospects for commercial and residential distribution and utilization of hydrogen 15 p0283 A77-33404
- Solar energy systems of the tower type - Arrangement and heat-stability of the receivers and steam generators 15 p0316 A77-37770
- A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators 16 p0437 A77-47426
- Utility facilities in transportation corridors [PB-255635/5] 13 p0093 N77-10970
- ENFORM: An energy information system [BNWL-2195] 16 p0542 N77-32016
- ENERGY LEVELS**
- Applied research in the general area of charged particle chemistry related to coal-fired MHD [PB-263873/2] 15 p0387 N77-26987
- ENERGY POLICY**
- The energy problem and the earth's fuel situation 13 p0004 A77-11027
- Energy and the developing countries 13 p0006 A77-11043
- Environmental aspects of energy conversion and use 13 p0006 A77-11044
- Principles of energy analysis 13 p0007 A77-11045
- Energy: Mathematics and models; Proceedings of the Conference, Alta, Utah, July 7-11, 1975 13 p0008 A77-11233

- The assurance of the heat supply with respect to the primary energy use in the case of heating and air conditioning installations 13 p0009 A77-11270
- Energy: A radical redirection 13 p0010 A77-11275
- The availability of fuels for power plants 13 p0010 A77-11316
- Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/ 13 p0013 A77-11524
- A methodical approach concerning energy supply problems 13 p0016 A77-12062
- Nuclear power - Compared to what --- energy alternatives for electric power generation 13 p0017 A77-12234
- The shaping of our needs in mineral raw materials and sources for meeting those needs --- Hungarian survey 13 p0017 A77-12246
- The significance of coal in the future energy picture 13 p0018 A77-12247
- Off-shore oil scenarios - Method and results 13 p0018 A77-12282
- Law and solar energy systems - Legal impediments and inducements to solar energy systems 13 p0018 A77-12401
- Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance 13 p0020 A77-12657
- An energy center in Sri Lanka --- UN rural energy development program 13 p0021 A77-12669
- Oil shale development 13 p0023 A77-12693
- Diversification as an energy conservation strategy 13 p0027 A77-12725
- Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis 13 p0029 A77-12745
- Electric utility companies and geothermal power 13 p0031 A77-12759
- The conservation of air purity and its effect on the energy economy 13 p0049 A77-13811
- Scientific-technological problems of the development of a fuel-energy complex in the USSR 13 p0051 A77-14703
- Energy: Conversion and utilization --- Book 13 p0052 A77-14957
- The reprocessing of nuclear fuels 13 p0055 A77-15807
- Perspectives for world energy production 13 p0056 A77-16202
- Environment and energy production after the year 2000 13 p0056 A77-16203
- Overview of the ERDA fusion power program 13 p0068 A77-18446
- Formulation of energy policies - The case of West Africa 13 p0080 A77-19124
- A system model for the investigation of alternative energy strategies --- German book 13 p0080 A77-19181
- Demand electric rates - A new problem and challenge for solar heating 14 p0137 A77-20388
- Low-Btu gas from coal has many potential markets 14 p0165 A77-23309
- Energy - An emerging role for aerospace 14 p0166 A77-23363
- A methodological survey of energy modeling 14 p0177 A77-24592
- Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply --- Book 14 p0179 A77-25224
- A preliminary assessment of solar energy technology [ASME PAPER 76-WA/TS-1] 14 p0190 A77-26531
- Model formulations for development planning of energy systems 14 p0191 A77-27036
- Political and economic justification for immediate realization of a syn fuels industry 14 p0191 A77-27276
- An overview of the U.S. energy dilemma 14 p0192 A77-27294
- On enthalpy management in small buildings --- energy storage and conservation in residential structures 14 p0194 A77-27354
- Geothermal energy development 14 p0194 A77-27881
- World coal resources and the role of coal in turn-of-the-century energy economy 14 p0198 A77-28758
- Report on Joint Conference Eno Foundation Board of Directors and Board of Consultants, October 13 and 14, 1976 15 p0260 A77-31064
- The law for saving energy and its significance for energy politics 15 p0261 A77-31372
- Energy policies of France, Britain, and Germany compared 15 p0263 A77-31572
- Equivalence of electricity and fuels - Contributing elements to a critical discussion 15 p0263 A77-31573
- Energy and natural resources 15 p0263 A77-31574
- Gas economy - Gas technology --- energy supply and utilization 15 p0263 A77-31576
- Energy demands: Modeling methods and techniques --- French book 15 p0264 A77-31595
- Potential energy: An analysis of world energy technology --- Book 15 p0264 A77-31825
- Industry can save energy without stunting its growth 15 p0267 A77-32209
- Role of the nuclear energy system in the total fuel-energy picture in the USSR 15 p0267 A77-32220
- Energy in competition --- coal and nuclear energy 15 p0271 A77-32799
- Waste economy and recycling: Problems and practice --- German book 15 p0273 A77-33303
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 15 p0278 A77-33365
- Technology impact assessment of the hydrogen economy concept - Key findings 15 p0284 A77-33414
- Hydrogen in the energy system of the Netherlands 15 p0285 A77-33420
- The politics of urban transportation innovation 15 p0287 A77-33600
- Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449
- Statistical utility theory for comparison of nuclear versus fossil power plant alternatives 15 p0291 A77-35015
- Institutional and environmental aspects of geothermal energy development 15 p0291 A77-35016
- The EPA role in energy research and development 15 p0291 A77-35148
- The outlook for more efficient fuel utilization in generation of process heat 15 p0294 A77-35400
- Energy and the economy - An interrelated perspective 15 p0298 A77-36243
- Energy management --- resources, supply, conversion and utilization 15 p0304 A77-36424
- Energy conservation and a healthy economy 15 p0305 A77-36612
- The year 2000 - Energy enough 15 p0306 A77-36725
- Coal gasification update 15 p0306 A77-36763
- Toward establishing a national energy policy 15 p0307 A77-36767
- Residential energy use alternatives to the year 2000 15 p0307 A77-36768

# SUBJECT INDEX

# ENERGY POLICY CONTD

Energy prospects in the Netherlands 15 p0307 A77-36801

Energy technology assessment - Considerations of geographical scale 15 p0309 A77-36822

North Slope oil and United States energy supply 15 p0309 A77-36823

The Wisconsin Regional Energy project - An applied systems analysis approach to regional energy/environment modeling 15 p0309 A77-36825

EPA's program in environmental research in wastes-as-fuel 15 p0315 A77-37668

Energy R&D modeling for budgetary decisions 15 p0319 A77-38218

The Energy Supply Planning Model - A working tool for regional analysis of alternative national energy policies 15 p0319 A77-38221

Energy conservation in the investment policies of French firms. I - Formulation of the problem 15 p0324 A77-39504

Comparative energy policies of France, England, and Germany. II - Electricity and nuclear energy 15 p0324 A77-39505

Alternatives to oil and gas through energy management [AIAA 77-1006] 16 p0403 A77-41553

Have energy, will travel --- alternative aviation energy sources in the future 16 p0409 A77-41933

The impact of the energy crisis on the demand for fuel efficiency - The case of general aviation 16 p0410 A77-42038

Economic aspects of U.S. energy independence in the coming decade 16 p0411 A77-42165

Methodological questions concerning the evaluation of the economic potential of energy resources 16 p0412 A77-42262

Creating a welcome for aerospace energy technology 16 p0413 A77-42561

Putting alternative sources of energy into prospective 16 p0414 A77-42633

Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif., May 12, 13, 1976, Proceedings 16 p0415 A77-42854

The United States energy dilemma - How can we solve it 16 p0415 A77-42855

Patterns of energy use and the critical choices ahead 16 p0415 A77-42856

Some impacts of restricting nuclear energy availability 16 p0415 A77-42857

Evaluation of energy policy 16 p0415 A77-42859

Future energy options, ethics and a case for conservation 16 p0415 A77-42860

A two-stage forecasting methodology for developing a national energy policy 16 p0419 A77-43144

Energy supply of the Federal Republic of Germany 16 p0419 A77-43566

Introduction to the ERDA electric and hybrid demonstration program --- electric and hybrid vehicle research and development 16 p0420 A77-43675

Electric vehicles - A major potential contribution to solution of U.S. energy problems 16 p0420 A77-44060

What's holding up coal gasification 16 p0423 A77-44522

Global problems and energy 16 p0425 A77-44688

The utilization of solar energy in Central Europe 16 p0426 A77-45461

Closed costs of electrical energy for different zones of load graphs of electrical energy systems 16 p0437 A77-47751

Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743

Sharing the sun: Solar technology in the seventies; Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volumes 1-10 16 p0469 A77-48910

Overview of Canadian activities in renewable energy resources 16 p0469 A77-48912

Solar residential demonstration program 16 p0469 A77-48914

The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report 16 p0470 A77-48918

Some legal-institutional implications of offshore wind energy conversion systems 16 p0489 A77-49086

Solar energy and urban settlements 16 p0494 A77-49127

Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132

Commercialization of solar heating and cooling of buildings 16 p0496 A77-49142

High-efficiency solar concentrator 13 p0083 N77-10104

The potential and economics of enhanced oil recovery [PB-254991/3] 13 p0086 N77-10633

Transportation energy conservation data book [ORNL-5198] 13 p0086 N77-10643

Utilization of geothermal energy [UTIAS-REVIEW-40] 13 p0087 N77-10644

Creating energy choices for the future. Public meeting on A National Plan for Energy Research, Development, and Demonstration [CONF-751228-P2] 13 p0087 N77-10646

Creating energy choices for the future [CONF-751228-P1] 13 p0087 N77-10647

Prospects for hydrogen production by water electrolysis to be competitive with conventional methods [BNL-20877] 13 p0087 N77-10648

Advanced coal gasification system for electric power generation --- pollution monitoring [FE-1514-176] 13 p0088 N77-10653

Waste heat vs conventional systems for greenhouse environmental control: An economic assessment [ORNL-TM-5069] 13 p0088 N77-10656

Energy fact book 1975. Parts 1-5: Appendixes A-H [AD-A023010] 13 p0089 N77-10664

Energy: The policy planning framework in state governments. Volume 1: Summary report [PB-254466/6] 13 p0089 N77-10665

Energy: The policy planning framework in state governments. Volume 2: Appendices [PB-254467/4] 13 p0089 N77-10666

Summary of EPA energy policy analysis [PB-253361/0] 13 p0089 N77-10669

Gasoline and distillate shortage situation: 1972-1976 [PB-253322/2] 13 p0089 N77-10670

Analysis of state solar energy options [PB-254730/5] 13 p0091 N77-10688

Baseline energy forecasts and analysis of alternative strategies for airline fuel conservation [PB-255351/9] 13 p0091 N77-10690

Mandatory Canadian crude oil allocation regulations [PB-255319/6] 13 p0096 N77-11509

Identification and analysis of mid-Atlantic onshore OCS impact [PB-254925/1] 13 p0096 N77-11516

Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units 13 p0096 N77-11525

National program for solar heating and cooling (residential and commercial applications) [ERDA-23A] 13 p0098 N77-11540

Mathematics for energy [PB-252463/5] 13 p0098 N77-11543

Energy information activities at the FEA [PB-253962/5] 13 p0099 N77-11553

Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems [PB-253097/0] 13 p0099 N77-11556

- Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy  
[PB-255696/7] 13 p0100 N77-11561
- Electric energy supply alternatives for New York. Phase 2: An appraisal of electrical energy alternatives available to the State of New York  
[PB-249881/4] 13 p0101 N77-11575
- Research to anticipate environmental impacts of changing resource usage  
[PB-256293/2] 13 p0101 N77-11602
- Future scenarios for urban transportation  
[PB-255349/3] 13 p0102 N77-11930
- Crude supply alternatives for the Northern Tier states. Volume 1: Executive summary  
[PB-255992/0] 13 p0107 N77-12531
- Crude supply alternatives for the Northern Tier states. Volume 2: Technical report  
[PB-255993/8] 13 p0107 N77-12532
- Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary  
[PB-255994/6] 13 p0107 N77-12533
- Impacts of synthetic liquid fuel development. Automotive market. Volume 2  
[PB-255995/3] 13 p0108 N77-12534
- Implementing coal utilization provisions of Energy Supply and Environmental Coordination Act  
[PB-255655/9] 13 p0109 N77-12549
- Inventory of energy research and development (1973 - 1975), volume 1  
[GPO-64-734-VOL-1] 13 p0113 N77-13525
- Inventory of energy research and development (1973 - 1975), volume 2  
[GPO-64-734-VOL-2] 13 p0113 N77-13526
- Inventory of energy research and development (1973 - 1975), volume 3  
[GPO-64-734-VOL-3] 13 p0113 N77-13527
- Inventory of energy research and development (1973 - 1975), volume 4  
[GPO-64-734-VOL-4] 13 p0113 N77-13528
- Definition study for photovoltaic residential prototype system  
[NASA-CR-135056] 13 p0113 N77-13533
- Final assessment of the environmental impacts of the State Energy Conservation Program (Public law 94-163, Title III, part C, The Energy Policy and Conservation Act)  
[PB-256044/9] 13 p0116 N77-13555
- Some cost, energy, environmental, and resource implications of synthetic fuels produced from coal for military aircraft  
[AD-A026667] 13 p0118 N77-14271
- Inventory of energy research and development (1973 - 1975), volume 5  
[GPO-64-734] 13 p0121 N77-14579
- Industrial process heat from shallow solar ponds  
[UCRL-77801] 13 p0124 N77-14611
- Participating surveillance services for electric power program. Coal conversion and utilization: Direct combustion of coal-90e, advanced power-90e. Summary for ERDA annual report, CY 1975  
[PB-1236-4] 13 p0130 N77-15507
- Rapid growth from energy projects: Ideas for state and local action. A program guide  
[PB-257374/9] 13 p0132 N77-15527
- Nuclear unit productivity analysis  
[PB-257553/8] 13 p0132 N77-15528
- Report to Congress on the economic impact of energy actions  
[PB-256684/2] 14 p0208 N77-16450
- Macro-economic impact and other considerations in selecting energy conservation measures  
[PB-257678/3] 14 p0208 N77-16454
- Aircraft fuel efficiency program  
[S-REPT-94-633] 14 p0209 N77-17032
- Solar cell collector and method for producing same --- indium alloy coatings  
[NASA-CASE-LEW-12552-1] 14 p0211 N77-17564
- Potential for energy conservation technology transfer  
[CONF-760536-1] 14 p0211 N77-17573
- Conceptual study for total utilization of an intermediate temperature geothermal resource  
[ANCR-1260] 14 p0211 N77-17579
- Summary report of three powerplant productivity studies  
[PB-257764/1] 14 p0212 N77-17598
- A survey of state legislation relating to solar energy  
[PB-258235/1] 14 p0213 N77-17600
- Fusion energy option  
[BNWL-SA-5802] 14 p0213 N77-17891
- Energy storage and transfer with homopolar machine for a linear theta-pinch hybrid reactor  
[LA-6174] 14 p0214 N77-17892
- In-situ laser retorting of oil shale  
[NASA-CASE-LEW-12217-1] 14 p0214 N77-18429
- Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project  
[ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- Balanced program plan. Volume 4: Coal conversion  
[ORNL-5123-VOL-4] 14 p0216 N77-18566
- Coal technology program  
[ORNL-5159] 14 p0216 N77-18568
- Central receiver solar thermal power system, phase 1  
[SAN/1110-76/T1] 14 p0216 N77-18570
- Solar pilot plant, phase 1  
[SAN/1109-76/T1] 14 p0216 N77-18571
- Utilization of solar energy  
[ERDA-TR-144] 14 p0216 N77-18572
- Economic study of solar total energy  
[SAND-76-5291] 14 p0216 N77-18574
- Development scenario for laser fusion  
[UCRL-76980] 14 p0216 N77-18575
- Ocean thermal energy conversion opportunities  
[BNWL-SA-5808] 14 p0217 N77-18581
- Proposed energy conservation contingency plan: Emergency heating, cooling and hot water restrictions. Economic impact analysis. Environmental impact assessment  
[PB-258624/6] 14 p0217 N77-18584
- Energy fact book 1976, chapters 1 through 21  
[AD-A028284] 14 p0218 N77-18592
- Proceedings of the 3rd Annual Energy Conservation Management Conference  
[PB-258652/7] 14 p0218 N77-18594
- Report to Congress on the economic impact of energy actions  
[PB-257697/3] 14 p0218 N77-18596
- Geothermal energy program, current research projects supported by the national science foundation  
[PB-258948/9] 14 p0218 N77-18597
- Evaluation of wind-energy sites from aeolian geomorphologic features mapped from LANDSAT imagery. First results  
[ERDA/NSF-00598/75/T1] 14 p0218 N77-18667
- Supply and demand of fuel sources for automobiles  
[UCRL-78066] 14 p0219 N77-19275
- Fuel and energy production by bioconversion of waste materials: State-of-the-art  
[PB-258499/3] 14 p0219 N77-19279
- Cryogenic instrumentation needs in the controlled thermonuclear research program  
[CONF-761007-1] 14 p0219 N77-19406
- Research, development and pilot production of high output thin silicon solar cells  
[NASA-CR-149858] 14 p0219 N77-19573
- Hydrogen Energy: A bibliography with abstracts. Fourth quarter 1976  
[NASA-CR-149864] 14 p0220 N77-19577
- Hydrogen Energy: A bibliography with abstracts. Third quarter 1976  
[NASA-CR-149863] 14 p0220 N77-19578
- A non-tracking solar energy collector system  
[NASA-CASE-NPO-13813-1] 14 p0220 N77-19579
- Coefficient of performance for solar-powered space cooling systems  
[CONF-760618-1] 14 p0220 N77-19585
- National plan for energy research, development and demonstration: Creating energy choices for the future. Volume 2: Program implementation --- fossil fuels, solar energy, and geothermal energy  
[ERDA-76-1-VOL-2] 14 p0222 N77-19600
- Regional energy system for the planning and optimization of national scenarios (RESPONS). Clean coal energy: Source-to-use economics project  
[ERDA-76-109] 14 p0222 N77-19602
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
[CONF-760906-8] 14 p0222 N77-19609

- Plan for developing moderate temperature/low salinity geothermal resources  
[ANCR-1318] 14 p0223 N77-19614
- Relationship of energy growth to economic growth under alternative energy policies  
[BNL-50500] 14 p0223 N77-19620
- Changing energy perspectives  
[UCRL-78153] 14 p0223 N77-19626
- Energy resources alternatives competition  
[COC-2658-1] 14 p0224 N77-19635
- Recovery of inaccessible coal reserves by in situ gasification  
[CONF-760906-5] 14 p0224 N77-19636
- Evaluation and targeting of geothermal energy resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642
- Net energy analysis: An energy balance study of fossil fuel resources  
[PB-259158/4] 14 p0225 N77-19657
- Net energy analysis: An energy balance study of fossil fuel resources. Summary report  
[PB-259159/2] 14 p0225 N77-19658
- Preliminary report on simulation of a heliostat field  
[ERDA-TR-158] 14 p0226 N77-19782
- Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149815] 14 p0227 N77-19898
- Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149814] 14 p0227 N77-19899
- Study of the feasibility of a regional solid waste derived fuel system in the Tennessee Valley Authority service area  
[PB-259764/9] 14 p0227 N77-19956
- Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking  
[NASA-CASE-MPS-23267-1] 14 p0228 N77-20401
- Solar energy collection system  
[NASA-CASE-MPO-13579-2] 14 p0229 N77-20565
- Low cost solar energy collection system  
[NASA-CASE-MPO-13579-3] 14 p0229 N77-20566
- Engineering-economic model of residential energy use  
[ORNL-TM-5470] 14 p0231 N77-20580
- Technical and economic aspects of potential US district heating systems  
[BNL-21287] 14 p0232 N77-20594
- Enhanced energy utilization from a controlled thermonuclear fusion reactor  
[PB-260653/1] 14 p0234 N77-20879
- Dynamics systems analysis of the relation between energy and the economy  
[BNL-21667] 14 p0235 N77-20931
- Projected natural gas curtailments and potential needs for additional alternate fuels, 1976-1977 heating season  
[PB-260535/0] 14 p0235 N77-21257
- A 100-kW metal wind turbine blade basic data, loads and stress analysis  
[NASA-CR-134956] 14 p0236 N77-21467
- A 100-kW wind turbine blade dynamics analysis, weight-balance, and structural test results  
[NASA-CR-134957] 14 p0236 N77-21468
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal  
14 p0243 N77-21627
- Some early perspectives on ground requirements of liquid hydrogen air transports  
14 p0243 N77-21628
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline  
14 p0243 N77-21629
- Fuel subsystem characteristics for LH2 aircraft  
14 p0243 N77-21630
- Water induction in hydrogen-powered IC engines  
14 p0243 N77-21631
- Development of a liquid hydrogen car  
14 p0244 N77-21632
- Dynamic tests of hydrogen-powered IC engines --- for mass transit vehicles  
14 p0244 N77-21633
- Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975  
14 p0244 N77-21634
- Automotive hydride tank design  
14 p0244 N77-21637
- A hydrogen-powered mass transit system  
14 p0244 N77-21638
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen  
14 p0245 N77-21647
- Hydrogen energy: Its potential promises and problems  
14 p0246 N77-21648
- Analysis of a Delphi study on hydrogen  
14 p0246 N77-21649
- ERDA's hydrogen programs  
14 p0246 N77-21650
- The NASA hydrogen energy systems technology study: A summary  
14 p0246 N77-21651
- Perspectives on the evolution into a hydrogen economy  
14 p0246 N77-21652
- Technology impact assessment of the hydrogen economy concept: Key findings  
14 p0246 N77-21653
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution?  
14 p0246 N77-21654
- The Greenland hydropower as a source of electrolytic hydrogen  
14 p0246 N77-21655
- Hydrogen in the seaward advancement of industrial societies  
14 p0246 N77-21656
- Energy and the future  
14 p0246 N77-21657
- Hydrogen use projections and supply options  
14 p0247 N77-21658
- Economics of nuclear - electrolytic hydrogen  
14 p0247 N77-21659
- A simplified equilibrium model of the US energy-economic system and its use in comparing alternatives  
14 p0247 N77-21662
- Proceedings of Second Geopressured Geothermal Energy Conference. Volume 2: Resource Assessment  
[CONF-760222-P2] 14 p0249 N77-21677
- Geothermal energy resource utilization program planning  
[MTR-7137] 14 p0249 N77-21683
- Vertical-axis wind turbine technology workshop  
[SAND-76-5586] 14 p0250 N77-21688
- A western regional energy development study: Economics. Volume 1: SRI energy model results  
[PB-260835/4] 14 p0251 N77-21706
- Energy for rural development: Renewable resources and alternative technologies for developing countries  
[PB-260606/9] 14 p0251 N77-21716
- Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 2: Solar electric power  
[PB-260595/4] 14 p0252 N77-21722
- State policies for geothermal development. Uncovering a major resource  
[PB-261744/7] 14 p0252 N77-21728
- Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir  
[PB-262391/6] 14 p0252 N77-21731
- Energy recovery from solid waste: A review of current technology  
[PB-260633/3] 14 p0253 N77-22016
- Strategic petroleum reserve plan (Public Law 94-163, section 154)  
[PB-261737/1] 15 p0342 N77-22591
- Solar energy in buildings: Implications for California energy policy  
[NASA-CR-152686] 15 p0343 N77-22613
- Energy and technology review  
[UCRL-52000-76-8] 15 p0345 N77-22627
- Influence of selected Federal statutes on energy development  
[BNWL-2084 (RAP-5)] 15 p0346 N77-22638
- Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642
- Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8] 15 p0346 N77-22643

- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities) [PB-261150/7] 15 p0346 N77-22644
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement [PB-261153/1] 15 p0346 N77-22645
- Report of the Presidential task force on reform of Federal Energy Administration regulations, volume 1 [PB-262181/1] 15 p0347 N77-22649
- Report of the Presidential task force on reform of Federal Energy Administration regulations, volume 2. Table of contents. Appendixes [PB-262182/9] 15 p0347 N77-22650
- California's energy future [AD-A032221] 15 p0348 N77-22667
- Perspective on energy policy [PB-261736/3] 15 p0348 N77-22674
- Strategic petroleum reserve. Final environmental impact statement, volume 1 [PB-261799/1] 15 p0349 N77-22675
- Strategic petroleum reserve. Final environmental impact statement, volume 2 [PB-261800/7] 15 p0349 N77-22676
- Energy input-output modelling: Problems and prospects [PB-261925/2] 15 p0349 N77-22679
- Sources of energy data for Illinois [PB-262562/2] 15 p0350 N77-22686
- Applications of aerospace technology to petroleum exploration. Volume 1: Efforts and results [NASA-CR-152694] 15 N77-22741
- Applications of aerospace technology to petroleum exploration. Volume 2: Appendices [NASA-CR-152693] 15 p0351 N77-22742
- Mathematical models for use in planning regional water resources and energy systems [PB-261364/4] 15 p0352 N77-23022
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis [NASA-CR-137923] 15 p0353 N77-23072
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses [NASA-CR-137924] 15 p0353 N77-23073
- Geothermal technoecosystems and water cycles in arid lands [PB-263091/1] 15 p0354 N77-23592
- Two investigations of flat-plate solar collector performance 15 p0355 N77-23598
- Development of an (AlGaAs-Ga As) graded band gap solar cell [NASA-CR-145161] 15 p0355 N77-23603
- Site energy handbook. Volume 1: Methodology for energy survey and appraisal [ERDA-76-131/1] 15 p0355 N77-23607
- Development and applications of spatial data resources in energy related assessment and planning [CONF-761017-1] 15 p0355 N77-23609
- Energy management guide for light industry and commerce. EPIC energy management series [PB-263121/6] 15 p0356 N77-23616
- State projections of industrial fuel needs [PB-263338/6] 15 p0356 N77-23620
- The future of natural gas: Economic myths, regulatory realities [PB-263625/6] 15 p0356 N77-23621
- JPL basic research review --- research and advanced development [NASA-CR-152689] 15 p0357 N77-23894
- Report to congress by the Federal Aviation Administration on the energy efficiency of agency regulations [AD-A034611] 15 p0359 N77-24103
- Assessment application for direct coal combustion [PB-263651/2] 15 p0359 N77-24318
- Incremental pricing of supplemental gas [PB-263689/2] 15 p0360 N77-24319
- The gas supplies of interstate natural gas pipeline companies, 1975 [PB-263598/5] 15 p0360 N77-24320
- Truck fleet experience with fuel economy improvement measures [PB-263022/6] 15 p0361 N77-24514
- Strategic petroleum reserve. Bryan Mound salt dome [PB-262839/4] 15 p0362 N77-24579
- Strategic petroleum reserve. West Hackberry salt dome [PB-262508/5] 15 p0362 N77-24580
- Baseline performance of solar collectors for NASA Langley solar building test facility [NASA-TM-X-3505] 15 p0363 N77-24587
- Energy self-sufficiency prospects for the British Columbia forest products industry [VP-X-166] 15 p0363 N77-24591
- Process energy reliability requirements for selected industries [ORNL-TM-5428] 15 p0364 N77-24594
- Future natural gas supply to the Northeast [BNL-50558] 15 p0364 N77-24595
- Planner's energy workbook: A users' manual for land use and energy utilization [BNL-21546] 15 p0364 N77-24596
- Alternative patterns of industrial energy consumption in the Northeast [BNL-50555] 15 p0364 N77-24597
- Annual cycle energy system: Initial investigations [ORNL-TM-5525] 15 p0364 N77-24599
- Second quarterly report to US House and Senate Committees on Appropriations [PB-263418/6] 15 p0365 N77-24616
- Energy models and large-scale systems optimization [AD-A033736] 15 p0365 N77-24619
- Barriers to the use of wind energy machines: The present legal/regulatory regime and a preliminary assessment of some legal/political/societal problems [PB-263576/1] 15 p0366 N77-24620
- Solar energy government buildings program policy and implementation plan [PB-262841/0] 15 p0366 N77-24622
- Report of the National Research Council Committee on Nuclear and Alternative Energy Systems [PB-263595/1] 15 p0367 N77-24633
- Role of the heat storage well future U.S. energy systems [PB-263480/6] 15 p0367 N77-24634
- Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply [PB-263761/9] 15 p0367 N77-24635
- Future oil supply to the northeast United States [BNL-50557] 15 p0369 N77-24719
- Study to assess the application of shadow pricing techniques to national energy resource planning [BNL-50537] 15 p0369 N77-24997
- Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil [BNL-50538] 15 p0369 N77-24998
- Effects of alternative oil stockpiling programs on the US economy, 1976-1979 [BNL-50541] 15 p0369 N77-24999
- Energy recovery from municipal solid waste, an environmental and safety mini-overview survey [ATR-76(7518)-7] 15 p0369 N77-25011
- Transportation programming, economic analysis, and evaluation of energy constraints [PB-262878/2] 15 p0370 N77-25018
- Program definition for the development of geothermal energy. Volume 1: Background and program definition summary [NASA-CR-153221] 15 p0371 N77-25612
- Program definition for the development of geothermal energy. Volume 2: Program definition development rationale and subprogram descriptions [NASA-CR-153222] 15 p0371 N77-25613
- Program definition for the development of geothermal energy. Volume 3: Appendixes [NASA-CR-153223] 15 p0371 N77-25614
- Program document for Energy Systems Optimization Program 2 (ESOP2). Volume 1: Engineering manual [NASA-CR-151422] 15 p0372 N77-25631
- Energy research: Alternative strategies for development of new energy technologies and their implications for the Federal budget [PAFER-10] 15 p0372 N77-25632
- Energy and resource planning group [UCBL-50029-76] 15 p0372 N77-25634

- Energy analysis handbook. CAC document 214  
[COO-2865-1] 15 p0372 N77-25635
- Perspectives in energy: 1976  
[CES-17] 15 p0372 N77-25636
- Magma energy research project, volume 2, no. 2  
[SAND-76-0264-VOL-2-NO-2] 15 p0372 N77-25638
- Proceedings of the Solar Industrial Process Heat Workshop  
[CONF-760655] 15 p0373 N77-25643
- United States special format report: Report of the Phoenix Corporation, city of Colorado Springs Solar Heating Project  
[SE-4578-76/1] 15 p0373 N77-25647
- Trends in power plant capacity and utilization. Inventory of power plants in the United States  
[PB-264451/6] 15 p0373 N77-25655
- Project Independence Evaluation System (PIES) documentation. Volume 1: The integrating model of the Project Independence Evaluation System  
[PB-263020/0] 15 p0374 N77-25661
- Electric utility coal consumption and generation trends, 1976-1985  
[PB-262483/1] 15 p0374 N77-25667
- Federal energy information gathering activities: A report to the President of the United States, and the Energy Resources Council  
[PB-262844/4] 15 p0374 N77-25668
- Projects to expand fuel sources in eastern states: Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976)  
[PB-262361/9] 15 p0374 N77-25669
- Laboratory evaluation of solar power units for marine aids to navigation  
[AD-A034587] 15 p0375 N77-25672
- A summary of the DARPA energy and materials shortages programs, fiscal years 1972-1976  
[AD-A036021] 15 p0375 N77-25677
- An analysis of the feasibility of windmills for power generation in New York State  
[RPI-TA-17] 15 p0380 N77-26638
- Silicon solar cell development for concentrated-sunlight, high-temperature applications  
[SAND-76-5311] 15 p0380 N77-26647
- Energy situation in New England  
[BNL-50580] 15 p0381 N77-26650
- Will a rapidly expanding power-generating system be part of the energy problem or part of its solution  
[UCRL-78500] 15 p0381 N77-26651
- Temperature dependence of the photovoltaic performance of Si cells under blue, white, and near-bandgap irradiation  
[UCRL-76203] 15 p0381 N77-26652
- Hydration-dehydration cycling of MgO-Mg(OH)2 for application to solar heat storage systems  
[AI-ERDA-13178] 15 p0381 N77-26654
- Experimental test of gas heat transfer system for hydroxide heat storage  
[AI-ERDA-13176] 15 p0381 N77-26655
- Results from circumsolar radiation measurements  
[LBL-5292] 15 p0382 N77-26657
- New energy conservation ideas for existing and new buildings  
[CONF-750942-2] 15 p0382 N77-26660
- Evaluation of the potential environmental effects of wind energy system development  
[ERDA/NSF-07378/75/1] 15 p0382 N77-26663
- Analysis of thermal performance of Solaris water-trickle solar collector  
[CONF-761107-17] 15 p0382 N77-26668
- Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 N77-26669
- Research and development of low cost processes for integrated solar arrays  
[COO-2721-76-1] 15 p0383 N77-26670
- Study of corrosion and its control in aluminum solar collectors  
[COO-2934-76-1] 15 p0383 N77-26673
- General Electric Company survey to define impact of statewide building codes on solar HVAC systems, commercial buildings. National Solar Demonstration Program  
[COO-2683-76-11] 15 p0383 N77-26674
- Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164] 15 p0383 N77-26675
- Comparative performance of solar heating with air liquid systems  
[COO-2868-1] 15 p0383 N77-26676
- The potential of lignocellulosic materials for the production of chemicals, fuels, and energy  
[PB-264458/1] 15 p0385 N77-26698
- Energy and physics  
[ERDA-TR-225] 15 p0386 N77-26916
- Identifying and analyzing methods for reducing the energy consumption of helicopters  
[NASA-CR-144953A] 15 p0388 N77-27104
- Study of Lyndon B. Johnson Space Center utility systems  
[NASA-TN-58196] 15 p0388 N77-27161
- Energy sources for tomorrow  
[ERDA-TR-226] 15 p0391 N77-27507
- Energy management in residential and small commercial buildings  
[BNL-50576] 15 p0392 N77-27511
- Coal conversion: Description of technologies and necessary biomedical and environmental research  
[ORNL-5192] 15 p0392 N77-27520
- Coal conversion program. Energy Supply and Environmental Coordination Act (as amended). Section 2  
[PB-265815/1] 15 p0393 N77-27542
- Mid-term and long term energy trends  
[PB-264740/2] 15 p0395 N77-27559
- MHD combustor design study --- coal-fired systems  
[TID-27144] 15 p0396 N77-27923
- Technical review and analysis of the total utility demonstration plant design and operational concept  
[AD-A037016] 15 p0398 N77-28040
- Long-term natural resource availability: Environmental and political implications in the United States  
[PB-265762/5] 16 p0511 N77-28327
- Optimal drawdown strategy for strategic petroleum reserves  
[PB-265838/3] 16 p0512 N77-28569
- An annotated bibliography, volume 1, appendix 2  
[NASA-TN-74765] 16 p0513 N77-28577
- An annotated bibliography, volume 2, appendix 2  
[NASA-TN-74764] 16 p0513 N77-28578
- A non-tracking solar energy collector system  
[NASA-CASE-NPO-13817-1] 16 p0513 N77-28583
- Solar pond  
[NASA-CASE-NPO-13581-2] 16 p0513 N77-28584
- Total energy systems: Solar energy program  
[SAND-76-5758] 16 p0514 N77-28591
- Biosolar synfuels for transportation  
[UCRL-52208] 16 p0514 N77-28593
- Briefing book on the energy situation in New England  
[BNL-21918] 16 p0515 N77-28599
- National program for solar heating and cooling of buildings  
[ERDA-76-6] 16 p0515 N77-28604
- Creating energy choices for the western region  
[ERDA-76-1-PH-3] 16 p0515 N77-28605
- Project Independence Evaluation System (PIES) documentation. Volume 7: Methodology for developing more complex investment and production profiles in the FEA oil and gas supply model  
[PB-264649/5] 16 p0516 N77-28607
- Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5] 16 p0516 N77-28610
- Projects to expand fuel sources in western states. Survey of planned or proposed coal oil shale, tar sand, uranium, and geothermal supply expansion projects, and related infrastructure, in states west of the Mississippi River (as of May 1976)  
[PB-265633/8] 16 p0516 N77-28614
- Energy consumption measurement: Data needs for public policy  
[PB-266039/7] 16 p0517 N77-28619
- Lightweight reflector assembly  
[NASA-CASE-NPO-13707-1] 16 p0518 N77-28933

- Federal assistance programs and energy development-impacted municipalities [PB-265804/5] 16 p0519 N77-29026
- Project Independence Evaluation System (PIES) documentation. Volume 9: Allocation of exploratory activity to oil and natural gas in the FEA oil and gas supply model [PB-265772/4] 16 p0519 N77-29325
- Project Independence Evaluation System (PIES) documentation. Volume 13: Coal and electric utility conventions for PIES [PB-265824/3] 16 p0519 N77-29326
- Project Independence Evaluation System (PIES) documentation. Volume 2: PIES econometric demand model [PB-265822/7] 16 p0519 N77-29327
- Strategic petroleum reserve. Supplement final environmental impact statement. West Hackberry salt dome [PB-265796/3] 16 p0520 N77-29597
- The strategic petroleum reserve and liquefied natural gas supplies [PB-265488/7] 16 p0520 N77-29598
- Development of standardized specifications for silicon solar cells [NASA-CR-135233] 16 p0520 N77-29604
- Polar energy resources potential [GPO-76-187] 16 p0520 N77-29605
- Energy utilization index method for predicting building energy use. Volume 2: Proposed supplement to TB ENG 529 [AD-A04C344] 16 p0521 N77-29608
- Energetics of the United States of America: An atlas [SNL-50501] 16 p0522 N77-29615
- Energy programs at the Johns Hopkins University Applied Physics Laboratory [AD-A038096] 16 p0522 N77-29623
- Energy fact book, 1977 --- energy sources, technology, and conservation [AD-A038802] 16 p0522 N77-29624
- The marketability of integrated energy/utility systems [PB-266042/1] 16 p0523 N77-29626
- Integrated utility systems: Feasibility study and conceptual design at the University of Florida [PB-266043/9] 16 p0523 N77-29627
- Integrated utility systems: Feasibility study and conceptual design at Central Michigan University [PB-266044/7] 16 p0523 N77-29628
- Project Independence Evaluation System (PIES) documentation. Volume 15: Standard data tables for PIES [PB-265155/8] 16 p0523 N77-29629
- Project Independence Evaluation System (PIES) documentation. Volume 8: Methodology for enabling the PIES oil and gas supply curves to respond to non-constant prices [PB-265086/9] 16 p0523 N77-29630
- Western energy/environment monitoring study: Planning and coordination summary [PB-266256/7] 16 p0523 N77-29632
- Forecast of likely US energy supply/demand balances for 1985 and 2000, and implications for US energy policy [PB-266240/1] 16 p0523 N77-29633
- Thin film solar cells for terrestrial applications [PB-265983/7] 16 p0523 N77-29635
- Energy conservation on campus. Volume 1: Guidelines [PB-266211/2] 16 p0524 N77-29636
- Energy conservation on campus. Volume 2: Case studies [PB-266212/0] 16 p0524 N77-29637
- Heat pumps: Substitutes for outmoded fossil-fueled systems [PB-266218/7] 16 p0524 N77-29638
- Analysis of energy projections for infrastructure development requirements [PB-266419/1] 16 p0524 N77-29640
- The environmental effects of using coal for generating electricity [PB-267237/6] 16 p0524 N77-29655
- The potential role of technological modifications and alternative fuels in alleviating Air Force energy problems [AD-A039597] 16 p0525 N77-30261
- Energy situation [PB-266836/6] 16 p0530 N77-30633
- Research on the application of solar energy to the food drying industry [PB-267210/3] 16 p0530 N77-30635
- Continuation of the adjustment as a production incentive to the maximum weighted average first sale price for domestic crude oil (Energy Action no. 11) [PB-266841/6] 16 p0530 N77-30636
- Land use, energy flow and policy making in society. SIHPAC handbook. A guide to the modeling of socio-economic phenomena [PB-267134/5] 16 p0530 N77-30637
- Optimization models for planning economic development [AD-A039165] 16 p0531 N77-31024
- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 N77-31207
- Methodology for the analysis of the impacts of electric power production in the West [LA-6720-PR] 16 p0533 N77-31428
- Fluid dynamic energy conversion and transfer processes [AD-A040589] 16 p0533 N77-31444
- The economics of solar home heating [GPO-85-329] 16 p0534 N77-31603
- FBA: Final reports on oil and gas resources, reserves, and productive capacities [GPO-80-748] 16 p0534 N77-31606
- Economic and budget impact of the President's energy proposals [GPO-93-689] 16 p0534 N77-31607
- Compilation of energy-related legislation. Volume 1: Oil, gas, and electric power [GPO-80-323] 16 p0534 N77-31608
- Compilation of energy-related legislation. Volume 2: Other energy legislation [GPO-80-324] 16 p0534 N77-31609
- Economic analysis of solar water and space heating [DSE/2322-1-SUPPL] 16 p0536 N77-31627
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California [UCRL-52180] 16 p0536 N77-31628
- Management plan for enhanced oil recovery. Volume 1: Program strategy [ERDA-77-15/1-VOL-1] 16 p0536 N77-31629
- Low-temperature thermal energy storage [ORNL-TM-5795] 16 p0536 N77-31631
- Heat source component development program [BML-1-676] 16 p0536 N77-31632
- Energy technologies for the West: The Fossil Option [TID-27430] 16 p0537 N77-31644
- Energy technologies for the West: General Session, volume 2 [TID-27427] 16 p0538 N77-31646
- Energy technologies for the West: Fission as an option [TID-27432] 16 p0538 N77-31647
- Energy Technologies for the West: Economic Growth and Energy [TID-27429] 16 p0538 N77-31648
- National benefits/costs of enhanced oil recovery research [FE-2021-4] 16 p0538 N77-31649
- Research and development in enhanced oil recovery. Part 2: The program [ERDA-77-20/2] 16 p0538 N77-31650
- Research and development in enhanced oil recovery. Part 3: The methodology [ERDA-77-20/3] 16 p0538 N77-31651
- A user's guide to the MIT world energy demand data base. Part 2: Data index [PB-266830/9] 16 p0539 N77-31660
- Federal energy information locator system: Energy information in the federal government [PB-262331/2] 16 p0539 N77-31661
- Energy Model Data Base (EMDB) using system 2000 [BNL-21854] 16 p0541 N77-31814
- Computer graphics demonstration: Area coal availability studies [PB-267923/1] 16 p0541 N77-31824
- Summary of cost and quality of electric utility plant fuels, 1976 [PB-267368/9] 16 p0543 N77-32335
- Solar photolysis of water [NASA-CASE-NPO-13675-1] 16 p0544 N77-32580



# SUBJECT INDEX

# ENERGY REQUIREMENTS

An initial comparative assessment of orbital and terrestrial central power systems  
[NASA-CR-155042] 16 p0546 N77-32594

Workshop to Review FEA's 1976 National energy outlook  
[PB-268149/2] 16 p0547 N77-32601

Study of electric and gas utilities and the public service commission of Nevada  
[PB-268481/9] 16 p0547 N77-32605

Improving regulatory effectiveness in Federal/State siting actions. Alternative financing methods  
[PB-269390/1] 16 p0547 N77-32606

Energy management for Texas commerce and industry  
[PB-268409/0] 16 p0548 N77-32616

National energy projections and plans of the USA  
[IAEA-CN-36/397] 16 p0548 N77-32619

Analysis and forecast of electrical distribution system materials. Volume 3: Appendix  
[CONS/2050-1-VOL-3-APP] 16 p0551 N77-33430

The President's energy program  
[GPO-88-556] 16 p0552 N77-33599

Review of electrochemical impregnation for nickel cadmium cells --- aerospace applications  
[NASA-CR-155155] 16 p0552 N77-33601

Solid polymer electrolyte (SPE) fuel cell technology program, phase 1/1A --- design and fabrication  
[NASA-CR-151506] 16 p0553 N77-33605

Solid polymer electrolyte (SPE) fuel cell technology program, phase 2/2A --- testing and evaluations  
[NASA-CR-151507] 16 p0553 N77-33606

Europe's changing energy relations  
[R-2086-ISA] 16 p0553 N77-33610

An approach for managing an energy conservation program  
[AD-A041086] 16 p0554 N77-33614

DoD energy R And D. Part 2: Military fuel operations. Performance and R and D implications  
[AD-A042272] 16 p0554 N77-33617

Sandia Laboratories energy programs  
[SAND-77-0034] 16 p0555 N77-33629

Design and cost study of a zinc/nickel oxide battery for electric vehicle propulsion  
[ANL-K-76-3543-1] 16 p0556 N77-33635

Analysis of the California energy industry  
[LBI-5928] 16 p0557 N77-33640

Accounting systems for energy conservation  
[LA-6569-MS] 16 p0557 N77-33646

Program plan for ERDA's participation in the IEA working party on energy conservation research and development  
[ERDA-77-57] 16 p0557 N77-33648

Solar radiation availability for New Mexico  
[SAND-77-0004] 16 p0558 N77-33654

Ecological considerations of the solar alternatives  
[LBI-5927] 16 p0558 N77-33655

Solar collector manufacturing activity  
[PB-266985/1] 16 p0558 N77-33664

Window design strategies to conserve energy  
[PB-269257/8] 16 p0559 N77-33669

Energy policy decisionmaking, organization, and national energy goals  
[PB-269299/4] 16 p0559 N77-33671

Public participation in energy related decision making, edited transcripts  
[PB-268781/2] 16 p0559 N77-33674

Energy interrelationships. A handbook of tables and conversions factors for combining and comparing international energy data  
[PB-269034/5] 16 p0559 N77-33675

Role of nuclear power in meeting future U.S. energy needs  
[IAEA-CN-36/396] 16 p0560 N77-33677

Energy options open to mankind beyond the turn of the century  
[IAEA-CN-36/538] 16 p0560 N77-33679

Survey of nuclear fuel cycle economics: 1970 - 1985  
[ORNL-TM-5703] 16 p0561 N77-33968

**ENERGY REQUIREMENTS**

Energy use in industry 13 p0005 A77-11029

Energy and the coal industry 13 p0005 A77-11030

Energy and the oil industry 13 p0005 A77-11031

Energy and the gas industry 13 p0005 A77-11032

Energy and the developing countries 13 p0006 A77-11043

Methods of energy analysis 43 p0007 A77-11046

Energy analysis in modelling 13 p0007 A77-11047

The overcoming of energy deficiencies with the aid of wind power 13 p0008 A77-11174

The wind and its effect on the heating requirements 13 p0009 A77-11266

Energy in the household - Comparison of heating costs and prognosis concerning the consumption of energy until 1985 13 p0015 A77-12059

A methodical approach concerning energy supply problems 13 p0016 A77-12062

The long-range prospects for solar energy 13 p0017 A77-12237

Load leveling with electric vehicles in the urban environment 13 p0024 A77-12701

Modeling residential energy use 13 p0027 A77-12726

The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements 13 p0028 A77-12735

Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis 13 p0029 A77-12745

Benefits of hydrogen production research 13 p0032 A77-12768

Power source requirements of electric propulsion systems used for north-south stationkeeping of communication satellites 13 p0040 A77-12833

Energy and environment post-2000 13 p0050 A77-14560

Perspectives for world energy production 13 p0056 A77-16202

Electric power supply in the case of airports. I 13 p0061 A77-16742

The future importance of solar energy for the supply of the German Federal Republic with energy 13 p0070 A77-18597

Hydel and solar power for Pakistan --- hydroelectric power 13 p0079 A77-19121

Demand electric rates - A new problem and challenge for solar heating 14 p0137 A77-20388

Worldwide energy development - Delayed opportunities 14 p0147 A77-21762

Effect of the characteristics of electrical supply networks on the design of solar power plants 14 p0155 A77-21858

The computer simulation of automobile use patterns for defining battery requirements for electric cars 14 p0159 A77-22879

The energy situation in Canada 14 p0165 A77-23307

Pumped-storage electric power generating plants 14 p0166 A77-23373

Can new resources fill the energy gap 14 p0166 A77-23380

The dilemma of future electric power demand 14 p0167 A77-23391

The potential for fuel conservation 14 p0178 A77-24960

Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply --- Book 14 p0179 A77-25224

Net energy analyses for liquid-dominated and vapor-dominated hydrothermal energy-resource developments 14 p0194 A77-27351

Parametric studies of applications of controlled thermonuclear reactor fusion energy for food production 14 p0194 A77-27356

Current problems in energy development and energy sciences 14 p0194 A77-27882

- The application of linear programming methods to the problem of choosing required reserves of energy for controlled plants 14 p0196 A77-28255
- Place and role of various energy resources in energetics of the future 15 p0261 A77-31468
- Energy-turn-rate characteristics and turn performance of an aircraft 15 p0265 A77-31855
- Role of the nuclear energy system in the total fuel-energy picture in the USSR 15 p0267 A77-32220
- A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives 15 p0285 A77-33421
- Contribution to the solution of planning problems in electric power generation /effects of random disturbances/ 15 p0294 A77-35399
- Near-term chemically-propelled space transport systems --- to space colonies 15 p0295 A77-35810
- Energy prospects in the Netherlands 15 p0307 A77-36801
- Overview of energy supply and demand 15 p0313 A77-37653
- International energy demand model - Twenty OECD country models 15 p0318 A77-38215
- A derived demand model of energy demand in the transportation sector 15 p0319 A77-38217
- A United States energy model economically driven by a global growth simulation 15 p0319 A77-38220
- Economic and energy considerations in MHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
- The significance of nuclear energy for satisfying future energy requirements 15 p0333 A77-39649
- Types of city development, energy supply, and possibilities for optimization 15 p0338 A77-40349
- Energy forecasts yesterday and today 16 p0400 A77-40683
- The possibility of using regression models for calculating the effect of weather conditions on electric energy demand 16 p0411 A77-42259
- The United States energy dilemma - How can we solve it 16 p0415 A77-42855
- Patterns of energy use and the critical choices ahead 16 p0415 A77-42856
- Global problems and energy 16 p0425 A77-44688
- Geography of energy production in France. V - The markets of consumption: The Paris region and the Lyon, Strasbourg and Rennes areas 16 p0427 A77-45712
- Energy supply to the year 2000: Global and national studies --- Book 16 p0428 A77-46093
- Energy demand studies: Major consuming countries. Analyses of 1972 demand and projections of 1985 demand --- Book 16 p0428 A77-46094
- Solar energy and the residence - Some systems aspects 16 p0502 A77-50213
- Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153
- The contribution of nuclear technology toward the solution of energy problems [INIS-MF-1867] 13 p0100 N77-11565
- California energy outlook [UCRL-5196-REV-1] 13 p0106 N77-12525
- Review of energy forecasting methodologies and assumptions [PB-255170/3] 13 p0107 N77-12526
- Net energy from nuclear power [PB-254059/9] 13 p0107 N77-12527
- Hydrodynamic equilibrium conditions for AG(BH) main strut-pod foil system using flap incidence control [AD-A027521] 13 p0127 N77-15220
- Economic analysis of the need for advanced power sources [HEDL-SA-989] 13 p0131 N77-15509
- Neutral beam energy and power requirements for the next generation of tokamaks [ERDA-76-77] 14 p0213 N77-17883
- Net energy analysis: An energy balance study of fossil fuel resources [PB-259158/4] 14 p0225 N77-19657
- An energy management guidance scheme applicable to the interim upper stage --- for orbital transfer maneuvers [AD-A034005] 15 p0353 N77-23143
- Solar breeder: Energy payback time for silicon photovoltaic systems [NASA-CR-153060] 15 p0362 N77-24581
- Pace and grade related to the oxygen and energy requirements, and the mechanics of treadmill running 15 p0396 N77-27689
- World energy supply and demand and the future of nuclear power [IAEA-CN-36/583] 16 p0560 N77-33680
- Nuclear power aspects in an oil and coal producing country [IAEA-CN-36/175] 16 p0560 N77-33681
- ENERGY SOURCES**
- Prospects of generating power with laser-driven fusion 13 p0002 A77-10634
- Energy from solid wastes --- Book 13 p0003 A77-10698
- Environmental aspects of energy conversion and use 13 p0006 A77-11044
- The availability of fuels for power plants 13 p0010 A77-11316
- Primary energy sources for hydrogen production 13 p0011 A77-11335
- Electricity and heat production - Energy efficiency versus cost efficiency 13 p0011 A77-11338
- The solution of the garbage problem: New proposals for the utilization of refuse - Proposals and suggestions --- materials recycling and energy production facilities 13 p0015 A77-12061
- Photosynthesis as a resource for energy and materials 13 p0017 A77-12233
- The shaping of our needs in mineral raw materials and sources for meeting those needs --- Hungarian survey 13 p0017 A77-12246
- The significance of coal in the future energy picture 13 p0018 A77-12247
- Diversification as an energy conservation strategy 13 p0027 A77-12725
- Geothermal studies in northern Nevada 13 p0029 A77-12742
- NASA thermionic-conversion program 13 p0043 A77-12863
- Wind-power generation on a large scale - A design idea 13 p0050 A77-14531
- Energy: Conversion and utilization --- Book 13 p0052 A77-14957
- Energy research for physicists 13 p0054 A77-15350
- Perspectives for world energy production 13 p0056 A77-16202
- Nova Scotia seeks to cut oil bill for power generation 13 p0063 A77-17588
- Geothermal energy in Saudi Arabia and its use in connection with solar energy 13 p0079 A77-19122
- The energy crisis today - A perspective 14 p0137 A77-20390
- Worldwide energy development - Delayed opportunities 14 p0147 A77-21762

# SUBJECT INDEX

# ENERGY SOURCES CONTD

Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096

Raw materials for energy generation in Canada 14 p0165 A77-23315

Can new resources fill the energy gap 14 p0166 A77-23380

Clean fuels from biomass 14 p0167 A77-23390

Shale oil, tar sands, and related fuel sources --- Book 14 p0169 A77-23551

Why solar energy --- advantages over fossil fuel and nuclear energy 14 p0170 A77-23654

Powersat - An astronautical energy solution 14 p0176 A77-24520

Prospects for fusion energy 14 p0178 A77-24928

Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply --- Book 14 p0179 A77-25224

Energy from the wind 14 p0179 A77-25575

An analysis of the role of energy in solid waste utilization and disposal 14 p0182 A77-26070

Energy LA: Tackling the crisis; Proceedings of the Second Greater Los Angeles Area Energy Symposium, Los Angeles, Calif., May 19, 1976 14 p0182 A77-26076

Net energy analyses for liquid-dominated and vapor-dominated hydrothermal energy-resource developments 14 p0194 A77-27351

Current problems in energy development and energy sciences 14 p0194 A77-27882

Electricity and the energy 'gap' 14 p0195 A77-27890

Power Sources Symposium, 27th, Atlantic City, N.J., June 21-24, 1976, Proceedings 14 p0195 A77-28126

Unconventional petroleum and natural gas resources. II - Additional gas resources 14 p0198 A77-28760

Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock 14 p0200 A77-29437

Energy-direct-conversion in solar technology 14 p0203 A77-29574

Alternative energy sources --- Book 15 p0261 A77-31467

Place and role of various energy resources in energetics of the future 15 p0261 A77-31468

The case for alternative energy sources 15 p0262 A77-31469

Gas economy - Gas technology --- energy supply and utilization 15 p0263 A77-31576

Regenerative energy sources --- energy conversion and utilization feasibility 15 p0263 A77-31577

Potential energy: An analysis of world energy technology --- Book 15 p0264 A77-31825

Energy from the oceans - Requirements and capabilities 15 p0272 A77-33141

Municipal solid waste recovery - A public or private risk 15 p0273 A77-33299

Applied solar energy: An introduction /2nd edition/ --- Book 15 p0286 A77-33445

Studies on the energy system of Hokkaido. I - First attempt: Model-I. II - Various data and their basis. III - Simulations by Model-I 15 p0287 A77-33526

Economics of alternative energy sources 15 p0288 A77-33755

Energy recovery from low heating value industrial waste 15 p0292 A77-35160

District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164

Utilizing alternative energy sources in France 15 p0296 A77-35923

Solar energy prospects grow for US southwest 15 p0297 A77-36049

China claims lead in biogas energy supply 15 p0297 A77-36050

Economics of crude oil and natural gas - Cost of adding production 15 p0300 A77-36327

Clean energy from Alaskan coals 15 p0301 A77-36333

Regional energy availability from conversion of solid waste 15 p0304 A77-36433

Energy research overview - Alternatives for energy development [AAS 75-280] 15 p0304 A77-36555

Energy prospects in the Netherlands 15 p0307 A77-36801

Energy from humid air [AIAA PAPER 77-730] 15 p0311 A77-37253

The supply of the Federal Republic of Germany and Western Europe with energy, giving particular consideration to the oil and gas potential of the North Sea 15 p0334 A77-39673

Energy resources available to man 16 p0402 A77-41422

New options in energy technology; Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 16 p0402 A77-41551

Alternatives to oil and gas through energy management [AIAA 77-1006] 16 p0403 A77-41553

Implementation issues of wind energy --- cost analysis [AIAA 77-1025] 16 p0404 A77-41565

Study of the feasibility of exploiting the galloping phenomenon as energy source 16 p0407 A77-41722

The roles of aerospace organizations in energy development or can aerospace success bring success in energy [AIAA PAPER 77-1001] 16 p0408 A77-41855

Have energy, will travel --- alternative aviation energy sources in the future 16 p0409 A77-41933

Electric energy alternatives appraisal for New York State 16 p0413 A77-42632

Putting alternative sources of energy into prospective 16 p0414 A77-42633

An econometric analysis of energy over the next 75 years 16 p0414 A77-42637

The prospects for renewable energy sources 16 p0415 A77-42858

Conference on Portable Power Sources in India, 1st, Calcutta, India, May 27, 28, 1976, Proceedings 16 p0420 A77-44052

Energy supply to the year 2000: Global and national studies --- Book 16 p0428 A77-46093

Thermal properties of subsurface rocks in the Ukraine 16 p0443 A77-48647

Development status and environmental hazards of several candidate advanced energy systems 16 p0452 A77-48776

Present state and perspective of solar energy applications in Mexico 16 p0469 A77-48911

Recent Canadian activities in biomass 16 p0470 A77-48917

Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018

Field crops as a future source of fuels and chemical feedstocks 16 p0489 A77-49080

Agricultural and forestry wastes as an energy resource 16 p0489 A77-49083

Perpetually renewable biomass prospects - A comparison of U.S. and Canadian ecosystem carrying capacities vs needs 16 p0489 A77-49084

Synchronous inversion - Concept and application --- use of intermittent variable power sources to supplement primary sources 16 p0490 A77-49088

Assuring the performance of fossil energy programs 16 p0503 A77-50499

The long-run marginal costs of energy [PB-252504/6] 13 p0085 A77-10625

Creating energy choices for the future [CONF-751228-P1] 13 p0087 A77-10647

Crude oil supply alternatives for the Northern Tier states [PB-255991/2] 13 p0107 A77-12530

Implementing coal utilization provisions of Energy Supply and Environmental Coordination Act [PB-255655/9] 13 p0109 A77-12549

Inventory of energy research and development (1973 - 1975), volume 1 [GPO-64-734-VOL-1] 13 p0113 A77-13525

Inventory of energy research and development (1973 - 1975), volume 4 [GPO-64-734-VOL-4] 13 p0113 A77-13528

Energy resources alternatives competition [COO-2698-1] 14 p0224 A77-19635

Net energy analysis: An energy balance study of fossil fuel resources [PB-259158/4] 14 p0225 A77-19657

Net energy analysis: An energy balance study of fossil fuel resources. Summary report [PB-259159/2] 14 p0225 A77-19658

First World Hydrogen Energy Conference proceedings, volume 1 14 p0237 A77-21552

Methods of on-board generation of hydrogen for vehicular use 14 p0242 A77-21617

Energy for rural development: Renewable resources and alternative technologies for developing countries [PB-260606/9] 14 p0251 A77-21716

Field-reversed mirror as a D-T power reactor [UCRL-78082] 15 p0351 A77-22967

CDIF combustor design [TID-27143] 15 p0377 A77-26393

Energy and physics [ERDA-TR-225] 15 p0386 A77-26916

Overview of MINPACK [CONF-760842-19] 15 p0356 A77-27761

Fusion. The future energy source [AEOL-10] 15 p0397 A77-27951

Production and processing of US tar sands: An environmental assessment [PB-266266/6] 16 p0513 A77-28575

Biosolar synfuels for transportation [UCRL-52208] 16 p0514 A77-28593

Projects to expand fuel sources in western states. Survey of planned or proposed coal oil shale, tar sand, uranium, and geothermal supply expansion projects, and related infrastructure, in states west of the Mississippi River (as of May 1976) [PB-265633/8] 16 p0516 A77-28614

National gas survey. Report to the federal power commission by the Supply-Technical Advisory Committee Study Subgroup on reserves and resources classifications [PB-265878/9] 16 p0519 A77-29324

Project Independence Evaluation System (PIES) documentation. Volume 15: Standard data tables for PIES [PB-265155/8] 16 p0523 A77-29629

Project Independence Evaluation System (PIES) documentation. Volume 8: Methodology for enabling the PIES oil and gas supply curves to respond to non-constant prices [PB-265086/9] 16 p0523 A77-29630

Space technology in the discovery and development of mineral and energy resources 16 p0526 A77-30289

Energy management for Texas commerce and industry [PB-268809/0] 16 p0548 A77-32616

Unconventional energy sources [PB-268301/9] 16 p0548 A77-32617

Role of fusion as a future power source [IAEA-CN-36/428] 16 p0549 A77-32895

## ENERGY STORAGE

Superflywheel energy storage and nonsynchronous AC/DC/AC electric transmission supplements power system operation 13 p0002 A77-10638

Energy storage --- quality, duration, methods and forms 13 p0006 A77-11040

Compressed air energy storage - A near term option for utility application 13 p0027 A77-12727

Underground storage of off-peak power 13 p0027 A77-12728

Storage in oil of off-peak thermal energy from large power stations 13 p0027 A77-12730

Thermal energy storage for solar power plants 13 p0027 A77-12731

Seasonal storage of thermal energy in water in the underground --- reservoirs 13 p0028 A77-12734

VBP heat pipes for energy storage --- Vapor Bubble Pumping 13 p0032 A77-12767

Energy storage via calcium hydride production 13 p0032 A77-12774

Metal hydrides of improved heat transfer characteristics 13 p0033 A77-12775

Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777

Survey of hydrogen energy application projects 13 p0033 A77-12778

Performance and cost analysis of photovoltaic power systems for on-site residential applications 13 p0038 A77-12816

A new hydrogen storage electrode 13 p0047 A77-13539

Hydrogen storage via iron-titanium for a 26 MW/e/ peaking electric plant 13 p0048 A77-13543

An alternative fuel for cars --- hydrogen production and storage 13 p0050 A77-14530

High-speed flywheels as possible energy storage devices in the future 13 p0056 A77-15856

Thermal energy storage for heating and air conditioning 13 p0057 A77-16206

The storage of energy in future energy supply systems [DGLR PAPER 76-182] 13 p0059 A77-16533

Energy storage in orbital and interplanetary missions [DGLR PAPER 76-189] 13 p0059 A77-16551

Electric arc power collection for high-speed trains 13 p0060 A77-16594

The influence of subsurface energy storage on seasonal temperature variations 13 p0067 A77-18351

Solar production of hydrogen as a means of storing solar energy 13 p0075 A77-19072

On the storage of solhydrogen 13 p0075 A77-19073

Storage of solar energy in the form of potential hydraulic energy 13 p0075 A77-19078

Electric load management and energy conservation 14 p0137 A77-20685

Fiber glass super flywheels 14 p0157 A77-22143

Energy storage in the form of latent heat 14 p0157 A77-22350

Operational chemical storage cycles for utilization of solar energy to produce heat or electric power 14 p0158 A77-22646

The nickel-zinc battery - A viable alternative for vehicle powering 14 p0160 A77-22894

Direct and indirect economics of wind energy systems relative to fuel based systems 14 p0165 A77-23358

# SUBJECT INDEX

# ENERGY STORAGE CONTD

- Allocation of standby power units in terms of the  
output power, in planning the development of  
power systems 14 p0167 A77-23406
- Hybrid propulsion system for motor vehicles with  
predominantly intermittent mode of operation 14 p0171 A77-23900
- Space battery technology for the 1980s  
[AIAA PAPER 77-482] 14 p0172 A77-23902
- Lithium-aluminum/metal sulfide batteries  
[AIAA PAPER 77-483] 14 p0172 A77-23903
- Advanced photovoltaic power systems  
[AIAA PAPER 77-506] 14 p0173 A77-23923
- Performance analysis of a solar-electrical system  
with a load and storage batteries 14 p0177 A77-24570
- Hydrogen technology for energy --- Book  
14 p0180 A77-25824
- A pressurized liquid concept for solar-thermal  
energy storage for the 24-hour continuous  
operation of an energy conversion system  
[ASME PAPER 76-WA/HT-38] 14 p0187 A77-26484
- On enthalpy management in small buildings ---  
energy storage and conservation in residential  
structures 14 p0194 A77-27354
- Energy storage propulsion system for advanced  
concept train --- braking energy recovery 14 p0200 A77-29467
- Solar energy can be self-supporting long-term  
energy storage 15 p0261 A77-31371
- Energy storage --- review 15 p0264 A77-31579
- Thermal energy storage --- in building elements,  
water and rock beds 15 p0264 A77-31698
- Performance characteristics of a high-pressure,  
moderate temperature, electrolysis system ---  
for hydrogen-based energy storage 15 p0277 A77-33361
- A farm energy system employing hydrogen storage  
15 p0278 A77-33366
- A wind energy system utilizing high pressure  
electrolysis as a storage mechanism 15 p0279 A77-33376
- Technical and environmental aspects of underground  
hydrogen storage 15 p0279 A77-33379
- Hydrogen storage on highway vehicles - Update '76  
15 p0280 A77-33380
- Methods of on-board generation of hydrogen for  
vehicular use 15 p0280 A77-33383
- Titanium alloy hydrides - Their properties and  
applications 15 p0280 A77-33385
- A thermodynamic analysis of H<sub>2</sub>CSOS, a hydrogen  
conversion and storage system 15 p0280 A77-33387
- A simple approach to metal hydride alloy  
optimization 15 p0281 A77-33388
- Selection of structural materials for hydrogen  
pipelines and storage vessels 15 p0281 A77-33390
- Energy storage possibilities of atomic hydrogen  
15 p0283 A77-33405
- On the storage of hydrogen by use of cryo-adsorbents  
15 p0283 A77-33408
- Applied solar energy: An introduction /2nd edition/  
--- Book 15 p0286 A77-33445
- Evaluating a combined wind power/energy storage  
system 15 p0287 A77-33596
- The chemical conversion of sunlight 15 p0287 A77-33598
- Simple thermal decomposition reactions for storage  
of solar thermal energy 15 p0292 A77-35153
- Solar energy and energy storage --- French book  
15 p0297 A77-36104
- Energy storage, compression, and switching --- Book  
15 p0299 A77-36284
- A multi-megajoule inertial-inductive energy  
storage system 15 p0299 A77-36292
- Superconductivity, energy storage and switching  
15 p0299 A77-36309
- The design, fabrication and testing of a five  
megajoule monopolar motor-generation --- energy  
storage for controlled fusion experiments 15 p0299 A77-36311
- The magnetic energy storage system used in ZT-1  
--- toroidal plasma pinch experiment 15 p0299 A77-36314
- Progress in switching technology for HETS systems  
--- Magnetic Energy Transfer and Storage 15 p0303 A77-36377
- Composite fiber flywheel for energy storage  
15 p0306 A77-36672
- An assessment of energy storage systems suitable  
for use by electric utilities 15 p0310 A77-36982
- Cryogenic temperature control by means of energy  
storage materials --- for long space voyages  
[AIAA PAPER 77-763] 15 p0314 A77-37273
- Modeling algorithms and their implementation on a  
digital computer for calculating the capacity of  
storage cells at wind-power and solar energy  
installations 15 p0316 A77-37775
- Whirl stability of the pendulously supported  
flywheel system [ASME PAPER 77-APM-20] 15 p0323 A77-38837
- Flywheel energy storage. I - Basic concepts  
15 p0323 A77-39314
- Flywheel energy storage. II - Magnetically  
suspended superflywheel 15 p0323 A77-39315
- Application of heat pipes to ground storage of  
solar energy [AIAA PAPER 77-729] 15 p0324 A77-39507
- Devolatilization of pulverized coal during rapid  
heating --- in exhaust gases of combustion  
driven MHD generators 15 p0331 A77-39566
- Answer House story --- utilizing solar cooling and  
solar heating 15 p0333 A77-39664
- Wolfersberg - A subterranean storage place for  
natural gas at a depth of 3000 m 15 p0334 A77-39669
- Natural gas storage in salt caverns 15 p0334 A77-39670
- California's aqueduct offers peaking power to Los  
Angeles 16 p0400 A77-40893
- The use of composite flywheels for braking energy  
recovery in road transport vehicles 16 p0401 A77-41351
- Compressed air energy storage  
[AIAA 77-1008] 16 p0403 A77-41555
- The annual cycle energy system - A hybrid heat  
pump cycle 16 p0408 A77-41823
- Cryogenic design for large superconductive energy  
storage magnets 16 p0411 A77-42156
- Design considerations on a thermal energy storage  
Stirling engine automobile [SAB PAPER 770080] 16 p0424 A77-44558
- Hydrogen and oxygen from water 16 p0430 A77-46573
- Simulation algorithms and their realization by  
digital computer for calculation of wind- and  
solar-plant storage-service capacity 16 p0437 A77-47431
- Energy storage - An interference assembled  
multiring superflywheel 16 p0450 A77-48761
- Conversion and storage of wind energy as  
nitrogenous fertilizer 16 p0450 A77-48762
- ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- Conceptual design of underground compressed air  
storage electric power systems 16 p0451 A77-48770
- A new family of hydrogen storage alloys based on  
the system nickel-mischmetal-calcium 16 p0457 A77-48817
- A hydrogen-halogen energy storage system for  
electric utility applications 16 p0457 A77-48818

- Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825
- Compressed air storage for load leveling of nuclear power plants 16 p0459 A77-48826
- Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831
- An assessment of mechanical energy storage for solar systems 16 p0460 A77-48839
- Cooling subsystem design in CSU Solar House III 16 p0475 A77-48964
- Performance of a solar heating system utilizing phase-change energy storage 16 p0480 A77-49004
- Climatological constraints on the development of solar energy in Canada 16 p0480 A77-49005
- Cost effective solar heating of houses with seasonal storage of energy 16 p0481 A77-49016
- Large windpower systems integrated with existing electric utilities 16 p0490 A77-49094
- An assessment of hydrogen as a means to store solar energy 16 p0492 A77-49107
- The use of functionalized polymers as photosensitizers in an energy storage reaction 16 p0501 A77-50208
- Pumped storage optimization in generation systems 16 p0506 A77-51284
- A new cycle for optimum energy storage in interplanetary missions [IAP PAPER 77-141] 16 p0507 A77-51444
- Critical materials problems in energy production --- Book 16 p0509 A77-51627
- Survey of high temperature thermal energy storage [SAND-75-8063] 13 p0088 A77-10655
- Underground pumped storage research priorities [PB-254413/8] 13 p0089 A77-10667
- Planning models for the assessment of advanced energy storage systems 13 p0105 A77-12504
- Economic and technical feasibility study of compressed air storage [COO-2559-1] 13 p0122 A77-14593
- Increased fuel economy in transportation systems by use of energy management - second year's program [PB-257177/6] 13 p0133 A77-15930
- Solar energy storage [AD-A028083] 14 p0213 A77-17605
- Energy storage and transfer with homopolar machine for a linear theta-pinch hybrid reactor [LA-6174] 14 p0214 A77-17892
- Storage of thermal energy in molten salts and metals [NASA-TT-F-17412] 14 p0220 A77-19574
- Energy storage: User needs and technology applications [CONF-760212-SUMM] 14 p0222 A77-19604
- Technical and economic feasibility of thermal energy storage [COO-2558-1] 14 p0222 A77-19605
- High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-9] 14 p0223 A77-19621
- Technical and economic feasibility analysis of the no-fuel compressed air energy storage concept [BNWL-2065] 14 p0225 A77-19643
- Composite fiber flywheel for energy storage [UCRL-78085] 14 p0225 A77-19645
- Applications and prospect of energy storage batteries [CONF-760416-2] 14 p0230 A77-20578
- Metal hydrides as hydrogen storage media and their applications [BNL-21648] 14 p0231 A77-20589
- A farm energy system employing hydrogen storage 14 p0239 A77-21600
- Hydrogen storage on highway vehicles: Update 1976 14 p0242 A77-21614
- Hydrogen vehicular fuel storage as a step in a water splitting cycle 14 p0242 A77-21615
- Hydrogen-powered highway vehicles: Applications and optimum form of fuel storage 14 p0242 A77-21616
- A thermodynamic analysis of HYCOSOS, a hydrogen conversion and storage system 14 p0242 A77-21622
- A simple approach to metal hydride alloy optimization 14 p0243 A77-21624
- Selection of structural materials for hydrogen pipelines and storage vessels 14 p0243 A77-21625
- Use of hydrogen in automotive engines 14 p0244 A77-21639
- Energy storage possibilities of atomic hydrogen 14 p0245 A77-21643
- On the storage of hydrogen by use of cryo-adsorbents 14 p0245 A77-21646
- Economic and technical feasibility study for energy storage flywheels [ERDA-76-65] 14 p0249 A77-21685
- Engineering design and cost analysis of chlorine storage concepts for a zinc-chlorine load-leveling battery [PB-262016/9] 14 p0252 A77-21727
- Strategic petroleum reserve. Final environmental impact statement for Bayou Choctaw Salt Dome [PB-261984/9] 15 p0341 A77-22294
- Development program for solid electrolyte batteries [PB-260719/0] 15 p0341 A77-22398
- Safety flywheel [NASA-CASE-BQN-10888-1] 15 p0342 A77-22484
- ERDA/Lewis research center photovoltaic systems test facility [NASA-TM-X-73641] 15 p0343 A77-22609
- A theory of control for a class of electronic power processing systems: Energy-storage dc-to-dc converters [NASA-CR-152696] 15 p0344 A77-22614
- Thermal energy storage for building heating and cooling applications [ORNL-TM-5700] 15 p0344 A77-22617
- Hydrogen storage, water electrolysis and fuel cells for electric energy storage [BNL-21498] 15 p0344 A77-22620
- High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-81] 15 p0345 A77-22631
- The 10th International Power Sources Symposium [AD-A033323] 15 p0347 A77-22656
- Strategic petroleum reserve. Final environmental impact statement, volume 1 [PB-261799/1] 15 p0349 A77-22675
- Strategic petroleum reserve. Final environmental impact statement, volume 2 [PB-261800/7] 15 p0349 A77-22676
- A computer program to calculate and plot wind-generated stored energy at constant consumption [AD-A029977] 15 p0356 A77-23613
- Strategic petroleum reserve. Bryan Mound salt dome [PB-262839/4] 15 p0362 A77-24579
- Strategic petroleum reserve. West Hackberry salt dome [PB-262508/5] 15 p0362 A77-24580
- Electrostatic energy storage [ORNL-TM-5529] 15 p0364 A77-24598
- Annual cycle energy system: Initial investigations [ORNL-TM-5525] 15 p0364 A77-24599
- Research leading to the production and early use of numeric data banks of material properties and system analyses [UCRL-50038-76-2] 15 p0364 A77-24601
- Molten salt thermal energy storage systems: Salt selection [COO-2888-1] 15 p0365 A77-24609
- Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany [ANL-ES-50] 15 p0365 A77-24612
- Superconducting energy storage development for electric utility systems [LA-UR-76-2294] 15 p0381 A77-26649
- Development of sodium-sulfur batteries for utility application [EPRI-EM-266] 15 p0391 A77-27510
- Performance of a solar heating system utilizing phase-change energy storage [CONF-760842-11] 15 p0393 A77-27540

# SUBJECT INDEX

# ENERGY TECHNOLOGY

- Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters  
[ANL-ES-54] 15 pC394 N77-27547
- Hydrogen storage by binary and ternary intermetallics for energy applications: A review  
[UCRL-52110] 15 p0394 N77-27548
- Hydrogen compatibility of structural materials for energy storage and transmission applications  
[SAND-76-8255] 15 p0395 N77-27553
- Factors affecting the electric power supply, 1980-85: Executive summary and recommendations  
[PB-264760/0] 15 p0395 N77-27560
- Superconducting magnetic energy storage  
[LA-UR-76-2047] 15 p0397 N77-27933
- Basic research on ceramic materials for energy storage and conversion systems  
[COO-2564-2] 16 p0511 N77-28305
- Optimal drawdown strategy for strategic petroleum reserves  
[PB-265838/3] 16 p0512 N77-28569
- Hydrogen production and storage in utility systems  
[BNL-50590] 16 p0515 N77-28600
- Applications of a doubly-fed induction machine in a large flywheel energy storage system  
16 p0520 N77-29602
- Optimal design of anisotropic (fiber-reinforced) flywheels  
[UCRL-52169] 16 p0522 N77-29616
- Energy accumulation through stationary flywheel systems  
[BNFT-FE-T-76-58] 16 p0522 N77-29620
- Energy programs at the Johns Hopkins University Applied Physics Laboratory  
[AD-A038096] 16 p0522 N77-29623
- Photon energy storage in organic materials: The case of linked anthracenes  
[AD-A039702] 16 p0535 N77-31615
- Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles  
[CONF-760617-3] 16 p0535 N77-31618
- Demonstration of an inductor motor/alternator/flywheel energy storage system  
[COO-4010-1] 16 p0535 N77-31620
- Low-temperature thermal energy storage  
[ORNL-TM-5795] 16 p0536 N77-31631
- Demonstration testing of a Vuilleumier cryocooler with an integral  
[AD-A042786] 16 p0547 N77-32599
- Design definition of a mechanical capacitor  
[NASA-CR-152613] 16 p0552 N77-33603
- Redox bulk energy storage system study, volume 1  
[NASA-CR-135206-VOL-1] 16 p0553 N77-33608
- Redox bulk energy storage system study, volume 2  
[NASA-CR-135206-VOL-2] 16 p0553 N77-33609
- Preliminary feasibility evaluation of compressed air storage power systems, volume 1  
[CONHSF/42-1] 16 p0556 N77-33636
- ENERGY TECHNOLOGY**
- The options for using the sun 13 p0001 A77-10318
- Satellite power systems for large-scale power generation  
[IAF PAPER 76-118] 13 p0003 A77-10914
- Energy and the coal industry 13 p0005 A77-11030
- Energy and the oil industry 13 p0005 A77-11031
- Energy and the gas industry 13 p0005 A77-11032
- Fusion power --- nuclear energy technology development 13 p0005 A77-11034
- Geothermal energy --- conversion technology development 13 p0005 A77-11035
- The atmosphere and the oceans as energy sources 13 p0005 A77-11036
- Solar energy --- conversion technology assessment 13 p0006 A77-11037
- Energy from wastes 13 p0006 A77-11038
- Large-scale electrical power generation and storage 13 p0006 A77-11039
- Energy storage --- quality, duration, methods and forms 13 p0006 A77-11040
- The hydrogen economy --- production and applications 13 p0006 A77-11041
- Total energy systems --- electric power generation with heat recovery 13 p0006 A77-11042
- Energy and the developing countries 13 p0006 A77-11043
- Methods of energy analysis 13 p0007 A77-11046
- A multilayer iron-thionine photogalvanic cell 13 p0007 A77-11108
- The overcoming of energy deficiencies with the aid of wind power 13 p0008 A77-11174
- Energy: Mathematics and models; Proceedings of the Conference, Alta, Utah, July 7-11, 1975 13 p0008 A77-11233
- Prospects for coal as a direct fuel and its potential through application of liquefaction and gasification technology 13 p0008 A77-11241
- Plastics for solar-energy collectors. I - General aspects, hot-water collectors, design variants 13 p0009 A77-11267
- Plastics for solar-energy collectors. II - Typical operational data and model parameters, functional diagrams, optimization of layer thicknesses 13 p0009 A77-11269
- Energy: A radical redirection 13 p0010 A77-11275
- Dutchess County, NY moves towards pyrolysis --- of solid wastes with fuel recovery 13 p0010 A77-11298
- Estimating wind power feasibility 13 p0010 A77-11315
- Submarine geothermal resources 13 p0010 A77-11322
- ERDA's gas turbine development program for the next decade 13 p0011 A77-11324
- Primary energy sources for hydrogen production 13 p0011 A77-11335
- The world's oil resources. V - Recovery rates 13 p0012 A77-11343
- Problems involved in improving the industrial fuel and energy balance 13 p0012 A77-11347
- Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497
- Locating interesting geothermal areas in the Tuscany region /Italy/ by geochemical and isotopic methods 13 p0013 A77-11498
- Prospects for solar energy utilization in Iran - Photothermal methods 13 p0013 A77-11532
- Energy recovery from saline water by means of electrochemical cells 13 p0013 A77-11536
- Microwave transmission system for space power 13 p0014 A77-11818
- Design principles for solar and wind power installations 13 p0015 A77-11922
- Optimization criteria for solar and wind power systems 13 p0015 A77-11923
- Coming - Solar power plants 13 p0016 A77-12125
- Nuclear power - Compared to what --- energy alternatives for electric power generation 13 p0017 A77-12234
- Synthetic fuels - Prices, prospects, and prior art 13 p0017 A77-12236
- The long-range prospects for solar energy 13 p0017 A77-12237
- The long-range prospects for solar-derived fuels 13 p0017 A77-12240
- Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies 13 p0018 A77-12361
- Developments in solar energy utilisation in the United Kingdom 13 p0018 A77-12402

- The solar water heater industry in South Florida - History and projections 13 p0018 A77-12403
- A cylindrical blackbody solar energy receiver 13 p0018 A77-12404
- Solar water pump for lift irrigation 13 p0019 A77-12406
- Intersociety Energy Conversion Engineering Conference, 11th, State Line, Nev., September 12-17, 1976, Proceedings. Volumes 1 & 2 13 p0020 A77-12662
- The fuel efficiency potential of a flywheel hybrid vehicle for urban driving 13 p0020 A77-12664
- The Osmotic power plant 13 p0021 A77-12668
- An energy center in Sri Lanka --- UN rural energy development program 13 p0021 A77-12669
- Comparative economics for the Arthur D. Little extractive coking process --- coal liquefaction 13 p0022 A77-12684
- Solids gasification for gas turbine fuel 100 and 300 Btu gas 13 p0022 A77-12685
- Recovery of inaccessible coal reserves by in situ gasification 13 p0022 A77-12686
- Low-Btu gasification of coal by Atomics International's molten salt process 13 p0023 A77-12687
- Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process 13 p0023 A77-12691
- Hydrocarbon fuels from oil shale 13 p0023 A77-12692
- In situ combustion of Michigan oil shale - Current field studies 13 p0024 A77-12695
- Retorting of single oil shale blocks with nitrogen and air 13 p0024 A77-12696
- Application of a shunt motor and a 2 cylinder gasoline engine as a hybrid drive for an automobile 13 p0025 A77-12703
- Baseline test data for the EVA electric vehicle --- low energy consumption automobiles 13 p0025 A77-12704
- Review of electrode designs and fabrication techniques for lithium-aluminum/iron sulfide cells 13 p0025 A77-12713
- Development status of lithium-silicon-iron sulfide load-leveling batteries 13 p0026 A77-12714
- Sodium/sulphur battery development in the United Kingdom 13 p0026 A77-12717
- Storage in oil of off-peak thermal energy from large power stations 13 p0027 A77-12730
- Thermal energy storage considerations for solar-thermal power generation 13 p0027 A77-12732
- Space heating systems new and conventional in the Northwest with emphasis on alternate energy adaptations 13 p0028 A77-12736
- Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737
- Thermochemical energy storage systems 13 p0028 A77-12738
- An evaluation of the use of metal hydrides for solar thermal energy storage 13 p0028 A77-12739
- Geothermal energy in Hawaii - Hydrothermal systems 13 p0029 A77-12741
- Geothermal powered heat pumps to produce process heat 13 p0030 A77-12754
- Direct applications of geothermal energy 13 p0030 A77-12755
- The utilization and economics of low temperature geothermal water for space heating 13 p0030 A77-12756
- Extracting energy from hydraulically-fractured geothermal reservoirs 13 p0030 A77-12757
- The use of program GEOTHM to design and optimize geothermal power cycles 13 p0031 A77-12758
- The potential national benefits of geothermal electrical energy production from hydrothermal resources in the West 13 p0031 A77-12760
- Prerequisites for military/civilian geopressured geothermal resource development 13 p0031 A77-12761
- An engineering feasibility study of using low temperature geothermal sources in Colorado 13 p0031 A77-12762
- The potential of the heat pipe in coal gasification processes 13 p0031 A77-12763
- Benefits of hydrogen production research 13 p0032 A77-12768
- The commercial production of hydrogen by the K-T process 13 p0032 A77-12769
- Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770
- Energy transmission from ocean thermal energy conversion plants 13 p0032 A77-12773
- MHD power generation - 1976 Status Report --- coal-fired design 13 p0033 A77-12782
- System studies of coal fired-closed cycle MHD for central station power plants 13 p0034 A77-12786
- Nuclear power for the production of synthetic fuels and feedstocks 13 p0035 A77-12790
- Nuclear driven water decomposition plant for hydrogen production 13 p0035 A77-12791
- Current status of the magnetic fusion program 13 p0035 A77-12792
- PACER - A practical fusion power concept 13 p0035 A77-12793
- The migma high energy advanced fuel direct conversion fusion power plant 13 p0035 A77-12794
- Radiolytic hydrogen production from a laser fusion system 13 p0035 A77-12795
- Isotope heat source for dynamic power systems 13 p0036 A77-12796
- Heat pipe nuclear reactor for space power 13 p0036 A77-12797
- Solar powered organic Rankine cycle engines - Characteristics and costs 13 p0036 A77-12798
- A unique Rankine-cycle heat pump system 13 p0036 A77-12799
- Solar energy prospects for electric power generation in Brazil 13 p0037 A77-12805
- The role of simulation in the development of solar-thermal energy conversion systems 13 p0037 A77-12809
- Collector field optimization for a solar thermal electric power plant 13 p0038 A77-12811
- Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812
- A fixed collector employing reversible vee-trough concentrator and a vacuum tube receiver for high temperature solar energy systems 13 p0038 A77-12813
- Alternative strategies for implementing silicon-ribbon technology for photovoltaic applications 13 p0039 A77-12819
- Experimental evaluation of the University of Florida solar powered ammonia/water absorption air conditioning system 13 p0039 A77-12823
- Transportation options for solar power satellites 13 p0040 A77-12829
- ERDA's Bicentennial Thermionic Research and Technology Program 13 p0042 A77-12861



## SUBJECT INDEX

## ENERGY TECHNOLOGY CONTD

NASA thersionic-conversion program 13 p0043 A77-12863

Operational, cost, and technical study of large windpower systems integrated with existing electric utility 13 p0043 A77-12867

Vortex kinetic energy concentrator 13 p0044 A77-12870

Numerical solution for the unsteady lifting characteristics of variable pitch cross-flow wind turbines 13 p0044 A77-12871

Design consideration for the Darrieus rotor --- wind turbines 13 p0044 A77-12872

Operational experience with small wind units 13 p0044 A77-12873

An experimental 200 kW vertical axis wind turbine for the Magdalen Islands 13 p0044 A77-12874

Underground gasification of coal: A National Coal Board reappraisal. 1976 --- Book 13 p0044 A77-12926

An advanced energy conservation technology program; Proceedings of the Intersociety Workshop Conference, Airlie House, Va., March 24-26, 1976 13 p0045 A77-12928

MHD - Energy transformation by burning coal 13 p0045 A77-12940

The U-240 cyclotron --- review of systems and processes 13 p0046 A77-13151

Dependability of wind energy generators with short-term energy storage 13 p0046 A77-13323

A hydride compressor 13 p0046 A77-13336

Life-cycle costs and solar energy 13 p0047 A77-13501

Optimizing solar cooling systems 13 p0047 A77-13502

Atlanta /Towns/ solar experiment - The lessons we learned 13 p0047 A77-13503

Feasibility of a satellite solar power station /SSPS/ 13 p0047 A77-13504

Evaluating a solar energy concentrator 13 p0047 A77-13505

The Shenandoah Community Center - A total solar design concept 13 p0047 A77-13506

Stage efficiency in the analysis of thermochemical water decomposition processes 13 p0047 A77-13538

Windmills stage a comeback --- review 13 p0048 A77-13624

Experiment on MHD generator with a large-scale superconducting magnet /ETL Mark V/ 13 p0049 A77-13728

Some material considerations involved in the application of solar energy to electric power generation 13 p0049 A77-13739

Energy and environment post-2000 13 p0050 A77-14560

Energy consumption in various modes of transportation 13 p0050 A77-14561

Characteristics of a system for transmitting concentrated solar radiation 13 p0051 A77-14578

Energetic calculation of the concentrating capacity of paraboloidal facets 13 p0051 A77-14579

Calculation of the radiation entering a 'hot box' type solar set-up 13 p0051 A77-14581

Scientific-technological problems of the development of a fuel-energy complex in the USSR 13 p0051 A77-14703

Satellite solar power stations and energy relay satellites 13 p0052 A77-14901

Energy: Conversion and utilization --- Book 13 p0052 A77-14957

Can Canada harness the wind 13 p0053 A77-15047

Utilization of solar power - A new departure 13 p0053 A77-15049

Energy research for physicists 13 p0054 A77-15350

The potential for application of energy storage capacity on electric utility systems in the United States. I 13 p0054 A77-15625

Cost aspects of solar energy - Selective and critical bibliography 13 p0054 A77-15799

Studies and thoughts on nuclear reactor systems 13 p0055 A77-15800

Geothermal sources and their utilization 13 p0055 A77-15803

Energy research in the UK 13 p0055 A77-15812

Geothermal power - The 'sleepers' in the energy race 13 p0056 A77-15845

Water power in the immediate future 13 p0056 A77-15850

Possibilities for utilizing wind energy 13 p0056 A77-15853

Space solar power - An available energy source 13 p0056 A77-15946

Future energy production systems: Heat and mass transfer processes. Volume 1 --- Book 13 p0056 A77-16201

Heat and mass transfer for solar energy utilization 13 p0057 A77-16205

Hydrogen production using nuclear heat 13 p0057 A77-16211

Combined cycles and refined coal --- gasification plant using high temperature gas turbines 13 p0058 A77-16249

New England wind power...coastal or mountain 13 p0058 A77-16250

The prospect for fusion --- controlled nuclear fusion 13 p0058 A77-16357

Hydrogen production from water by means of chemical cycles 13 p0058 A77-16471

The storage of energy in future energy supply systems [DGLR PAPER 76-182] 13 p0059 A77-16533

Windmills change direction --- British system utilizing offshore windmills and depleted North Sea fields 13 p0060 A77-16620

Potentialities and limitations of the utilization of wind machines 13 p0061 A77-16787

Superalloys for advanced energy systems 13 p0061 A77-16824

Energy and environmental considerations in extending heat pump applications 13 p0062 A77-17058

Homeowner's guide to solar heating and cooling --- Book 13 p0062 A77-17525

Fossil energy research and development in ERDA 13 p0063 A77-17551

Problems of energy storage in solar power stations 13 p0063 A77-17555

Application of solar energy in the high-temperature range 13 p0063 A77-17636

Geothermal energy development 13 p0064 A77-17801

Increase in the efficiency of heat and power systems using large artificial accumulators of heat 13 p0064 A77-17939

Alkali metal space power technology applicable to national energy research and development [AIAA PAPER 77-289] 13 p0065 A77-18223

Solar power satellites - Opportunity and challenge [AIAA PAPER 77-291] 13 p0065 A77-18224

The application of aerospace technology to solar thermal electric power generation [AIAA PAPER 77-294] 13 p0065 A77-18226

OTEC - Aerospace and ocean engineering in partnership --- Ocean Thermal Energy Conversion [AIAA PAPER 77-296] 13 p0066 A77-18227

Gas turbine electric powerplants [AIAA PAPER 77-346] 13 p0066 A77-18254

Perspectives on Satellite Solar Power [AIAA PAPER 77-352] 13 p0066 A77-18257

Parametric studies of the thermal trap flat plate collector 13 p0068 A77-18443

Overview of the ERDA fusion power program 13 p0068 A77-18446

Coal liquefaction with soluble transition-metal complexes 13 p0070 A77-18584

The future importance of solar energy for the supply of the German Federal Republic with energy 13 p0070 A77-18597

A solar house with heat pipe collectors 13 p0070 A77-18598

Heliotechnique and development; Proceedings of the International Conference, Dhahran, Saudi Arabia, November 2-6, 1975. Volumes 1 & 2 13 p0072 A77-19043

Performance of an annular cylindrical solar collector 13 p0073 A77-19059

Solar water heater using hardened black polythene pipe absorbers 13 p0073 A77-19060

Solergy collector concept --- immobile reflective surface for solar collection using spiral concentrator 13 p0073 A77-19061

Double-reflection solar energy concentrators 13 p0074 A77-19067

Periodically adjustable concentrators adapted to solar cell panels 13 p0074 A77-19068

Stationary solar concentrators for industrial heating and cooling 13 p0074 A77-19069

Cylindrical mirror collector field 13 p0074 A77-19071

Solar production of hydrogen as a means of storing solar energy 13 p0075 A77-19072

Photovoltaic effect applications 13 p0075 A77-19080

Photovoltaic systems using sunlight concentration 13 p0076 A77-19089

Double-faced silicon solar cell system 13 p0076 A77-19090

Electric energy from atmospheric water vapor 13 p0077 A77-19097

The two enemies of industrial development of solar energy - Simplicity and economy 13 p0078 A77-19109

Heating a building by means of solar and electrical energy 13 p0078 A77-19113

New frontiers in solar and other energy options 13 p0079 A77-19118

Improved use of energy --- through waste and solar energy utilization 13 p0079 A77-19123

The role of solar energy in developing nations - The perspectives in Mali 13 p0080 A77-19125

Research at the EURATOM-CCB Center --- on solar energy 13 p0080 A77-19126

Solar energy in Switzerland 13 p0080 A77-19127

Problems of transportation power plants 14 p0136 A77-20004

Wind power --- wind-powered plant design 14 p0136 A77-20042

Coal gasification and its relation to tested power plants 14 p0136 A77-20074

Principles of atomic central heating 14 p0136 A77-20102

Flue gas desulfurization experience 14 p0136 A77-20381

The energy crisis today - A perspective 14 p0137 A77-20390

Deashing of coal liquefaction products via partial deasphalting. I - Hydrogen-donor extraction effluents. II - Hydrogenation and hydroextraction effluents 14 p0138 A77-20725

On the solar energy problem --- for heat and electric power production 14 p0138 A77-20742

Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility 14 p0139 A77-21215

Utilization of Western coal for MHD energy conversion 14 p0140 A77-21230

Development of a baseline reference design for an open cycle MHD power plant for commercial service 14 p0140 A77-21232

The technology base for large MHD superconducting magnets 14 p0140 A77-21233

Progress on the Mark VI long-duration MHD generator 14 p0141 A77-21237

Experimental investigation on a direct coal-fired MHD generator 14 p0141 A77-21238

System studies of coal fired-closed cycle MHD for central station power plants 14 p0142 A77-21267

Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269

The quality category in solar engineering 14 p0143 A77-21310

Conversion of solar energy by photosynthetic production of molecular hydrogen 14 p0143 A77-21316

Superconducting magnets for an MHD test facility and base load power plant 14 p0144 A77-21379

Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator 14 p0144 A77-21386

Wind energy for human needs 14 p0145 A77-21400

Wide-range control of a thermal interconnection network --- waste incineration utilization supplying pipelined steam heat 14 p0145 A77-21545

Alcohol - A Brazilian answer to the energy crisis --- automobile fuel from manioc 14 p0145 A77-21673

Solar photothermal power generation 14 p0146 A77-21700

Research on battery-operated electric road vehicles 14 p0146 A77-21701

Is commercial coal conversion practical 14 p0146 A77-21761

Technology of large area Cu/x/S-CdS solar cells 14 p0149 A77-21798

Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813

Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814

Interaction between the solar mirror field and the thermodynamic system of a turning solar power plant 14 p0151 A77-21824

Thermal optimization of steam generating systems for tower type solar steam power plants - Tasks and methods 14 p0152 A77-21830

The solar tower as a source of thermal electric energy 14 p0152 A77-21831

Status report on the German experimental study for terrestrial solar electric generators 14 p0153 A77-21836

A power plant of the Aerosolec type 14 p0153 A77-21839

Development of a 10 kWe solar thermal power station 14 p0154 A77-21844

Potentialities of electric energy production by means of thermoelectric generators 14 p0154 A77-21847

Photovoltaic conversion of solar energy using optical concentration systems 14 p0154 A77-21849

Effect of the characteristics of electrical supply networks on the design of solar power plants 14 p0155 A77-21858

Combined gas/steam cycle power and heat generating plants 14 p0155 A77-22023

# SUBJECT INDEX

# ENERGY TECHNOLOGY CONTD

Small gas turbines and the Total Energy concept  
14 p0156 A77-22024

The principles of system studies in nuclear energy  
research  
14 p0157 A77-22342

Four different views of the heliostat flux density  
integral  
14 p0158 A77-22645

Economic competitiveness of solar energy with  
conventional fuels and electricity  
14 p0158 A77-22648

Solar energy concentration with liquid lenses  
14 p0158 A77-22649

Applications of cryogenic technology. Volume 8 ---  
Book  
14 p0159 A77-22868

Traction batteries for existing and future  
electric road vehicles  
14 p0159 A77-22878

User experience with the Enfield car --- electric  
motor vehicle  
14 p0159 A77-22884

The M.A.N. electrobus experience gained in  
large-scale tests  
14 p0160 A77-22900

New energy systems - Associated thermodynamic cycles  
--- French book  
14 p0162 A77-22924

Research and development of geothermal energy  
production in Hungary  
14 p0163 A77-23034

Status and outlook of controlled nuclear fusion  
14 p0163 A77-23095

Path of development and developmental status of  
the lignite high-temperature coking process in  
the DDR - An example of effective utilization of  
lignite as energy vehicle  
14 p0163 A77-23096

Mathematical simulation of the fixed-bed  
pressurized gasification process  
14 p0164 A77-23097

Hydrocarbon cracking developments in the DDR  
14 p0164 A77-23098

On the production of town gas from off-gases of  
the chemical processing industry  
14 p0164 A77-23099

Solar energy conversion - Work experience of a  
team applying methods and techniques of physics  
research to this sector  
14 p0164 A77-23296

Design and testing of planar solar collectors  
14 p0164 A77-23298

Advanced technologies for photovoltaic cell  
fabrication  
14 p0165 A77-23300

Fuel cells - Prospects of their applications for  
electric utilities  
14 p0165 A77-23306

The energy situation in Canada  
14 p0165 A77-23307

Low-Btu gas from coal has many potential markets  
14 p0165 A77-23309

Aspects of surface wind behaviour  
14 p0165 A77-23357

Direct and indirect economics of wind energy  
systems relative to fuel based systems  
14 p0165 A77-23358

A possible saturation criterion for wind energy  
extraction  
14 p0165 A77-23359

Large scale Wind Energy Conversion System /WECS/  
design and installation as affected by site wind  
energy characteristics, grouping arrangement and  
social acceptance  
14 p0165 A77-23360

Engineering development status of the Darrieus  
wind turbine  
14 p0166 A77-23365

Pumped-storage electric power generating plants  
14 p0166 A77-23373

Can new resources fill the energy gap  
14 p0166 A77-23380

Periodically adjustable concentrators adapted to  
solar cell panels  
14 p0166 A77-23385

The dilemma of future electric power demand  
14 p0167 A77-23391

The ASHRAE monograph on applications of solar  
energy for heating and cooling buildings  
14 p0167 A77-23441

Design application using solar energy to control  
the environment in a major office building  
14 p0168 A77-23442

Solar absorption air-conditioning performance in  
central Ohio  
14 p0168 A77-23443

The use of commercially available absorption units  
on solar-powered cooling systems  
14 p0168 A77-23445

The national laser-fusion program  
14 p0168 A77-23502

Fuel cells - A sleeper in the energy race  
14 p0170 A77-23647

Why solar energy --- advantages over fossil fuel  
and nuclear energy  
14 p0170 A77-23654

A progress report on the national program for  
solar heating and cooling  
14 p0170 A77-23656

International cooperation on development of  
hydrogen technologies  
14 p0171 A77-23717

Advanced silicon solar cell production technology  
[AIAA PAPER 77-485]  
14 p0172 A77-23905

The selenide isotope generators  
[AIAA PAPER 77-498]  
14 p0173 A77-23916

Thermionic energy conversion technology - Present  
and future  
[AIAA PAPER 77-500]  
14 p0173 A77-23918

A rationale for large space-based solar power  
systems  
[AIAA PAPER 77-510]  
14 p0173 A77-23926

Future energy production systems: Heat and mass  
transfer processes. Volume 2 --- Book  
14 p0174 A77-24201

Possible applications of geothermal energy in France  
14 p0175 A77-24208

Gasification of coal and its future aspects  
regarding the use of heat from high-temperature  
nuclear reactors  
14 p0175 A77-24210

Gasification of coal in high-velocity fluidized beds  
14 p0175 A77-24211

Gasification of Rhenish brown coal as mined  
14 p0175 A77-24213

Electricity from the thermal power of the sea  
14 p0176 A77-24218

Heat exchangers for the Ocean Thermal Energy Power  
Plant  
14 p0176 A77-24219

Theoretical and experimental validation of new  
sources of electrical energy  
14 p0176 A77-24457

Solar retrofit in a large institutional building -  
An economic analysis  
14 p0176 A77-24500

The ERDA geothermal program  
14 p0177 A77-24603

National Solar Energy Convention, Jadavpur  
University, Calcutta, India, November  
29-December 1, 1976, Proceedings  
14 p0177 A77-24659

The potential for fuel conservation  
14 p0178 A77-24960

'Low-energy' geothermal heat  
14 p0178 A77-25001

Review - Silicon solar cells for terrestrial  
applications  
14 p0178 A77-25085

East Mesa Geothermal Component Test Facility  
14 p0178 A77-25136

Net energy delivery from geothermal resources  
14 p0178 A77-25137

Our energy future: The role of research,  
development, and demonstration in reaching a  
national consensus on energy supply --- Book  
14 p0179 A77-25224

Basic research problems in the generation of  
electrochemical energy for powering small  
private vehicles  
14 p0180 A77-25721

Rotor/generator isolation for wind turbines  
[AIAA 77-372]  
14 p0180 A77-25782

Hydrogen technology for energy --- Book  
14 p0180 A77-25824

- Fuel cells --- Book 14 p0180 A77-25875
- Solar heating and cooling of a 25,500 square foot building 14 p0181 A77-26054
- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House 14 p0182 A77-26058
- Drying of refuse-derived fuel for energy recovery from municipal solid waste 14 p0182 A77-26071
- Energy LA: Tackling the crisis; Proceedings of the Second Greater Los Angeles Area Energy Symposium, Los Angeles, Calif., May 19, 1976 14 p0182 A77-26076
- Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078
- The high potential of wind as an energy source 14 p0183 A77-26084
- Flap-augmented shrouds for aerogenerators 14 p0183 A77-26085
- Energy recovery by mini-hydroelectric projects 14 p0183 A77-26089
- Power production from high salinity geothermal waters 14 p0183 A77-26090
- Harnessing the ocean waves, swells and tides 14 p0183 A77-26091
- Largest ever liquefaction plant will test H-coal process 14 p0184 A77-26289
- Coal gasifier projects gather momentum 14 p0184 A77-26290
- Underground gasification offers clean safe route to coal energy 14 p0184 A77-26292
- Chemical cleaning of coal [ASME PAPER 76-WA/APC-2] 14 p0184 A77-26409
- An economic evaluation of small-scale wind powered electric generation systems [ASME PAPER 76-WA/ENER-1] 14 p0185 A77-26430
- Tornado-type wind energy system - Basic consideration [ASME PAPER 76-WA/ENER-2] 14 p0185 A77-26431
- Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASME PAPER 76-WA/HT-10] 14 p0186 A77-26470
- A self-contained solar powered tracking device [ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477
- A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- The proper use of thermal storages for a solar assisted heat pump heating system [ASME PAPER 76-WA/HT-76] 14 p0187 A77-26492
- Solar powered absorption cycle simulation using real and stochastic weather data [ASME PAPER 76-WA/SOL-6] 14 p0188 A77-26511
- The New Mexico Department of Agriculture solar heated and cooled building [ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515
- Experimental measurements and system implications of the performance of flat plate solar collector configurations [ASME PAPER 76-WA/SOL-14] 14 p0189 A77-26519
- Design and simulation studies for the Shenandoah Community Center large-scale solar cooling demonstration [ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520
- Performance evaluation on the Owens-Illinois Sunpack solar energy collector [ASME PAPER 76-WA/SOL-16] 14 p0189 A77-26521
- Analysis of thermal performance of 'Solaris' water-trickle solar collector [ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526
- An experimental and analytical investigation of a solar water heater [ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- A preliminary assessment of solar energy technology [ASME PAPER 76-WA/TS-1] 14 p0190 A77-26531
- Solar power from the oceans --- ocean thermal energy conversion 14 p0190 A77-26724
- More about geothermal steam or the hottest energy prospect ever --- Book 14 p0191 A77-26925
- Model formulations for development planning of energy systems 14 p0191 A77-27036
- SO2 control technologies - Commercial availabilities and economics 14 p0191 A77-27279
- Applications of the Woodall-Duckham two stage coal - gasification 14 p0191 A77-27284
- Fluidized coal combustion - What can be done now 14 p0191 A77-27285
- The SYNTHANE process - Current status --- coal gasification 14 p0192 A77-27286
- Comparison of coal conversion processes for electric power generation 14 p0192 A77-27288
- The H-Coal Process --- liquefaction 14 p0192 A77-27289
- Fluidized bed combustion 14 p0192 A77-27290
- The SRC-II process --- fuel oil and hydrogen production by Solvent Refined Coal technique 14 p0192 A77-27292
- Environmental aspects of coal conversion plant siting and cost of pollution control 14 p0192 A77-27293
- An overview of the U.S. energy dilemma 14 p0192 A77-27294
- HYGAS process update --- hydrogen gasification of coal 14 p0192 A77-27296
- The Riley-Morgan gasifier 14 p0193 A77-27298
- Current status of the BI-GAS process 14 p0193 A77-27300
- Fracturing oil shale for in situ retorting experiments 14 p0193 A77-27341
- Development of the modified in situ oil-shale process 14 p0193 A77-27342
- In-place recovery of multiple products from Colorado's saline-mineral-bearing Piceance Basin 14 p0193 A77-27344
- Field experiment of in-situ oil recovery from a Utah tar sand by reverse combustion 14 p0193 A77-27348
- Recovery of bitumen from oil-impregnated sandstone deposits of Utah 14 p0194 A77-27349
- Net energy analyses for liquid-dominated and vapor-dominated hydrothermal energy-resource developments 14 p0194 A77-27351
- Geothermal development and the Salton Sea 14 p0194 A77-27352
- On enthalpy management in small buildings --- energy storage and conservation in residential structures 14 p0194 A77-27354
- State of the art of controlled fusion 14 p0194 A77-27722
- Geothermal energy development 14 p0194 A77-27881
- Current problems in energy development and energy sciences 14 p0194 A77-27882
- Electricity and the energy 'gap' 14 p0195 A77-27890
- Gas-fired heat pumps - An emerging technology 14 p0195 A77-27891
- Bibliography on solar cells 14 p0195 A77-28067
- Hydrocarbon fuel conditioner for a 1.5 kW fuel cell power plant 14 p0195 A77-28168
- Superalloys - Their use and requirements in advanced energy systems 14 p0196 A77-28322
- Tertiary oil production process 14 p0196 A77-28520
- Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling [ASME PAPER 77-GT-2] 14 p0197 A77-28522

## SUBJECT INDEX

## ENERGY TECHNOLOGY CONTD

Design considerations for heat recovery system for DD-963 class ship  
[ASME PAPER 77-GT-106] 14 p0197 A77-28616

Solar collectors - Technology and principles of operation 14 p0157 A77-28676

Plastics in systems of solar technology - A survey 14 p0197 A77-28677

The MBB solar houses - Design, operation, and experience 14 p0197 A77-28678

Possibilities and economic limits concerning solar heating 14 p0197 A77-28679

Solar generators - Utilization of solar energy for supply of electric power 14 p0197 A77-28681

World coal resources and the role of coal in turn-of-the-century energy economy 14 p0198 A77-28758

Underground gasification of coal 14 p0198 A77-28759

Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium 14 p0198 A77-28776

Reactivity heat-treated coals in hydrogen --- for synthetic methane production 14 p0198 A77-28777

Induction devices - A new type of magnetohydrodynamic converter 14 p0198 A77-28786

The laser solenoid - An alternate use of lasers in fusion power 14 p0198 A77-28962

Alternative approaches to space-based power generation 14 p0199 A77-29066

Aerodynamic design of a conventional windmill using numerical optimization 14 p0199 A77-29070

Recent results in the research area 'energetics' with respect to nonnuclear energy research 14 p0200 A77-29300

Coal devolatilization and hydrogasification 14 p0200 A77-29450

Effects of selected R&D options on fuel usage in the commercial air system 14 p0201 A77-29472

Composition method for constructing guaranteed-output curves of solar- and wind-power plants utilized jointly 14 p0201 A77-29534

Principles of solar technology I; Meeting, 2nd, Stuttgart, West Germany, October 22, 1976, Reports 14 p0201 A77-29562

Meteorological data regarding the utilization of solar energy 14 p0202 A77-29563

Selective behavior and selective layer deposition in the case of light-transparent covers --- for solar collectors 14 p0202 A77-29564

The selectivity of absorbing layers --- of solar collector materials 14 p0202 A77-29565

Collectors, pipelines, and heat storage units made of plastics 14 p0202 A77-29567

Physical, chemical, and technological principles of latent heat storage 14 p0203 A77-29571

The determination of the performance characteristics of solar collectors 14 p0203 A77-29573

Energy-direct-conversion in solar technology 14 p0203 A77-29574

Optics in solar energy utilization II; Proceedings of the Seminar, San Diego, Calif., August 24, 25, 1976 14 p0203 A77-29576

The development of a satellite solar power station 14 p0203 A77-29577

Photovoltaic energy conversion using concentrated sunlight 14 p0203 A77-29579

GaAs solar cells for very high concentrations 14 p0204 A77-29581

An educated ray trace approach to solar tower optics 14 p0204 A77-29592

Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber 14 p0204 A77-29594

Thermal efficiency of geothermal power 14 p0205 A77-29788

New hydrogen process is in the works 14 p0205 A77-29789

Methanol - A clean burning fuel for automobile engines 14 p0205 A77-29930

The future with fusion power 14 p0205 A77-29938

Combined production of electrical power and desalinated water by nuclear power plants 15 p0255 A77-30100

Principles and systems for utilization of solar energy in heating and preparation of hot water 15 p0255 A77-30257

Calculation of long term solar collector heating system performance 15 p0255 A77-30311

Solar-heated-air receivers --- of solar/gas turbine electrical generation plant design 15 p0255 A77-30312

Optimum solar collector operation for maximizing cycle work output 15 p0255 A77-30313

Design and performance studies on a solar room heater 15 p0255 A77-30314

Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data 15 p0256 A77-30315

Solar flux density distributions on central tower receivers 15 p0256 A77-30318

Use of solar generators in Africa for broadcasting equipment 15 p0256 A77-30320

Performance data for a terrestrial solar photovoltaic/water electrolysis experiment 15 p0256 A77-30321

Non-focussing solar concentrators of easy manufacture 15 p0256 A77-30322

Energy investment in nuclear and solar power plants 15 p0257 A77-30599

Technology of GaAs metal-oxide-semiconductor solar cells 15 p0259 A77-30739

Solar energy can be self-supporting long-term energy storage 15 p0261 A77-31371

Economy of tap water heating in summer by means of solar energy 15 p0261 A77-31374

Optimal tap water heating 15 p0261 A77-31375

Alternative energy sources --- Book 15 p0261 A77-31467

Place and role of various energy resources in energetics of the future 15 p0261 A77-31468

Applications of fluidized beds in coal technology 15 p0262 A77-31470

The French CNRS 1000 kW solar furnace - Description, performance characteristics, present utilization, and perspectives 15 p0262 A77-31473

Solar-thermal power systems 15 p0262 A77-31474

Geothermal power utilization, present and future 15 p0262 A77-31475

Equivalence of electricity and fuels - Contributing elements to a critical discussion 15 p0263 A77-31573

Gas economy - Gas technology --- energy supply and utilization 15 p0263 A77-31576

Regenerative energy sources --- energy conversion and utilization feasibility 15 p0263 A77-31577

Energy storage --- review 15 p0264 A77-31579

Potential energy: An analysis of world energy technology --- Bock 15 p0264 A77-31825

Critical comments concerning the application of the availability concept in power plant technology 15 p0265 A77-31850

Use of a Lowry-type spatial allocation model in an urban transportation energy study 15 p0265 A77-31899

Assessment of satellite power stations [AIAA PAPER 77-552] 15 p0266 A77-32069

Considerations on coal gasification 15 p0266 A77-32169

Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks 15 p0267 A77-32243

Molecular synthesis in the case of the Fischer-Tropsch synthesis - Reaction steps of the molecular synthesis by means of the catalytic transformation of carbon monoxide and hydrogen 15 p0268 A77-32248

Synthesis of substitute natural gas on the basis of coal 15 p0268 A77-32249

Cooling with solar energy 15 p0268 A77-32401

Novel development for economic solar-energy utilization 15 p0268 A77-32402

A solar generator --- for cold-steam turbine operations 15 p0268 A77-32403

Hydrogen production with HOT ELLY --- high temperature vapor phase-electrolysis of water 15 p0269 A77-32404

Solar electric power generating stations in space - XXI century energy or a utopia 15 p0269 A77-32470

Energy from bio-conversion for developing countries 15 p0270 A77-32592

Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593

Oxidation-erosion of materials in high velocity hot gases 15 p0270 A77-32604

Energy in competition --- coal and nuclear energy 15 p0271 A77-32799

Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility 15 p0271 A77-32800

Solar technology: Solar energy in practical application /3rd revised and enlarged edition/ --- German book 15 p0271 A77-33113

Wind energy in practical use: Wheels, rotors, mills, wind power plants --- German book 15 p0271 A77-33114

The impact of the new energy technologies 15 p0272 A77-33124

Combined utilization of nuclear and organic fuels 15 p0272 A77-33159

Solid waste incineration and energy recovery in hospitals 15 p0272 A77-33283

An Otto for the automobile. II --- comparing engines utilizing different configurations and thermodynamic cycles 15 p0273 A77-33302

Waste economy and recycling: Problems and practice --- German book 15 p0273 A77-33303

World Hydrogen Energy Conference, 1st, Miami Beach, Fla., March 1-3, 1976, Proceedings. Volumes 1, 2 & 3 15 p0273 A77-33326

Progress in the Los Alamos Scientific Laboratory Program to develop thermochemical processes for hydrogen production 15 p0275 A77-33341

Recent developments of large electrolytic hydrogen generators 15 p0277 A77-33358

Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 15 p0277 A77-33359

Development of a low capital cost electrolyzer --- for hydrogen production 15 p0277 A77-33362

Modern technology electrolysis for power application 15 p0278 A77-33364

Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 15 p0278 A77-33365

A farm energy system employing hydrogen storage 15 p0278 A77-33366

Microbial hydrogen production 15 p0278 A77-33367

Feasibility of hydrogen production by direct water splitting at high temperature 15 p0279 A77-33372

Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374

Ocean thermal energy delivery systems based on chemical energy carriers 15 p0279 A77-33375

A wind energy system utilizing high pressure electrolysis as a storage mechanism 15 p0279 A77-33376

Technical and environmental aspects of underground hydrogen storage 15 p0279 A77-33379

Methods of on-board generation of hydrogen for vehicular use 15 p0280 A77-33383

Hydrogen energy - Its potential promises and problems 15 p0284 A77-33410

The NASA Hydrogen Energy Systems Technology study - A summary 15 p0284 A77-33411

Will the large-scale production of hydrogen be part of the energy problem or part of its solution 15 p0284 A77-33415

The Greenland hydropower as a source of electrolytic hydrogen 15 p0285 A77-33416

Hydrogen use projections and supply options 15 p0285 A77-33418

Economics of nuclear-electrolytic hydrogen 15 p0285 A77-33419

Hydrogen in the energy system of the Netherlands 15 p0285 A77-33420

Present status of resources development --- of geothermal energy in world nations 15 p0286 A77-33523

An update of world geothermal energy development 15 p0286 A77-33524

Nonisothermal hydrogen-induced desulfurization of coal 15 p0287 A77-33544

Evaluating a combined wind power/energy storage system 15 p0287 A77-33596

The chemical conversion of sunlight 15 p0287 A77-33598

Sun power: An introduction to the applications of solar energy --- Book 15 p0288 A77-33967

Solar electricity for military applications 15 p0289 A77-34113

'Free' and renewable energy sources 15 p0289 A77-34306

Features of systems for transmission of concentrated solar radiation 15 p0290 A77-34972

Energy computation of concentrating capability of paraboloidal facets 15 p0290 A77-34973

Calculation of radiation entering 'hot box' solar unit 15 p0291 A77-34975

The sun-tracking control of solar collectors using high-performance step motors 15 p0291 A77-35030

Energy and the environment; Proceedings of the Third National Conference, Oxford, Ohio, September 29-October 1, 1975 15 p0291 A77-35146

The development of net energy estimates for extraction, handling, and processing of selected fuels 15 p0291 A77-35147

## SUBJECT INDEX

## ENERGY TECHNOLOGY CONTD

- The EPA role in energy research and development 15 p0291 A77-35148
- Use of municipal waste for fuel 15 p0291 A77-35149
- Materials utilization in a direct coal-fired MHD generator system 15 p0292 A77-35151
- Solar heating and cooling systems - A reality today 15 p0292 A77-35154
- Refuse to energy Memphis style 15 p0292 A77-35156
- Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157
- Energy recovery from solid waste using the Union Carbide Purox system 15 p0292 A77-35159
- Energy recovery from low heating value industrial waste 15 p0292 A77-35160
- Torrax - A system for recovery of energy from solid waste. P. J. Page 15 p0293 A77-35163
- District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164
- Solar energy, its conversion and utilization 15 p0294 A77-35316
- The University of Florida solar house 15 p0294 A77-35317
- Solar properties of materials and testing of solar systems 15 p0294 A77-35318
- Solar cooling of a Florida welcome station - A demonstration 15 p0294 A77-35319
- Tests of a combined wind and solar power plant under natural conditions 15 p0294 A77-35415
- Development of the satellite solar power station 15 p0296 A77-35815
- Closed Brayton cycle turbines for satellite solar power stations 15 p0296 A77-35816
- Solar energy and energy storage --- French book 15 p0297 A77-36104
- Comparative breeding characteristics of fusion and fast reactors 15 p0297 A77-36124
- On the feasibility of small power satellites 15 p0298 A77-36264
- Superconductivity, energy storage and switching 15 p0299 A77-36309
- The design, fabrication and testing of a five megajoule monopolar motor-generation --- energy storage for controlled fusion experiments 15 p0299 A77-36311
- Synthetic fuels processing: Comparative economics; Proceedings of the Symposium, New York, N.Y., April 4-9, 1976 15 p0300 A77-36326
- Economic evaluation by ERDA of alternative fossil energy technologies 15 p0300 A77-36328
- Economic comparison of synthetic fuels - Gasification and liquefaction 15 p0300 A77-36329
- Winkler technology for clean fuels from coal 15 p0301 A77-36337
- Economics of synthetic gas production by the SEGAS process 15 p0302 A77-36341
- Technology and economics of industrial fuel gas from coal 15 p0302 A77-36342
- Ground water as energy carrier 15 p0302 A77-36347
- The question of the utilization of geothermal energy in dry rocks /dry walls/ 15 p0303 A77-36348
- The OTEC answer to OPEC - Solar sea power 15 p0303 A77-36409
- Solar energy in the building --- French book 15 p0303 A77-36411
- Present status of fluidised-bed combustion 15 p0303 A77-36422
- Solar collection systems - The rationale 15 p0304 A77-36426
- Solar thermal systems --- solar farm and tower installations for domestic use 15 p0304 A77-36449
- 80 per cent of the heat requirements satisfied by the sun --- in solar house 15 p0304 A77-36450
- Energy research overview - Alternatives for energy development [AAS 75-280] 15 p0304 A77-36555
- Technologies lead to conservation --- in munition plants 15 p0305 A77-36634
- Composite fiber flywheel for energy storage 15 p0306 A77-36672
- Thin films in energy systems --- for energy conserving structural materials 15 p0306 A77-36673
- Coal gasification update 15 p0306 A77-36763
- Direct production of methane and benzene from coal 15 p0306 A77-36766
- Solar energy - A part of the answer 15 p0307 A77-36796
- North American views of energy choices for the future particularly fluid fuels synthesized from coal 15 p0307 A77-36807
- Trends in Western Europe --- lignite gasification cost effectiveness 15 p0308 A77-36808
- Conventional gasification technologies 15 p0308 A77-36810
- Advanced gasification technologies 15 p0308 A77-36811
- Fundamentals of coal liquefaction 15 p0309 A77-36814
- Energy technology assessment - Considerations of geographical scale 15 p0309 A77-36822
- The economics of solar home heating systems for the southwest region 15 p0309 A77-36824
- Tidal power generation in India 15 p0310 A77-36988
- What price wind power --- wind turbine efficiencies 15 p0310 A77-37248
- Energy from humid air [AIAA PAPER 77-730] 15 p0311 A77-37253
- Research needs report: Energy conversion research --- Book 15 p0313 A77-37646
- Wastes and biomass as energy resources - An overview 15 p0313 A77-37654
- Union Electric Company's 8000 ton per day solid waste utilization system 15 p0313 A77-37656
- The conversion of ocean farm kelp to methane and other products 15 p0314 A77-37662
- Energy from agriculture 15 p0314 A77-37664
- Design, operation and economics of the energy plantation 15 p0315 A77-37667
- Federal Fuels from Biomass Energy Program 15 p0315 A77-37670
- The PUROX System --- solid waste partial oxidation to fuel gas 15 p0315 A77-37671
- Modeling aspects of a gas turbine solar-electric power system 15 p0318 A77-38210
- Sea water - The energy elixir --- ocean thermal, tide and wave energy conversion 15 p0320 A77-38446
- Fuels from biomass - Energy outlay versus energy returns: A critical appraisal 15 p0322 A77-38673
- Accounting methods for new-technology non-utility energy installations 15 p0322 A77-38675
- Approaches to extracting potentially recoverable hydrocarbons --- nuclear explosive mining of natural gas and crude oil 15 p0322 A77-38786
- A review of gasification for power generation 15 p0322 A77-38790

- Application of solar energy in Belgium - Study of a flat plate collector --- Flemish book on materials, applications and design parameters 15 p0324 A77-39499
- A heat capacitor for MHD electric power generation systems 15 p0331 A77-39571
- Status of the reference dual-cycle MHD-steam power plant 15 p0332 A77-39577
- Open-cycle coal burning MHD power plants for commercial service 15 p0333 A77-39578
- The significance of nuclear energy for satisfying future energy requirements 15 p0333 A77-39649
- Pacific Northwest geothermal: 1976 review, 1977 outlook 15 p0335 A77-39817
- Options for the conversion of fossil fuels 15 p0335 A77-39835
- U.S. options for a transition from oil and gas to synthetic fuels 15 p0335 A77-39836
- Solar energy: Applications, systems, experience; Lecture and Discussion Meeting, Essen, West Germany, February 4, 1977, Reports 15 p0335 A77-39976
- Solar collectors - Technology and principles of operation 15 p0335 A77-39977
- Possibilities for the solar air conditioning of buildings 15 p0335 A77-39978
- Plastics in systems of solar technology 15 p0336 A77-39979
- Solar generators - Utilization of solar energy for power-supply applications 15 p0336 A77-39980
- The future of solar-thermal small-scale power stations 15 p0336 A77-39981
- The Philips energy-experimentation house - Results and experience 15 p0336 A77-39982
- The solar system in the solar house Dornier/RWE in Essen 15 p0336 A77-39983
- The BBC solar house - Design and experience 15 p0336 A77-39984
- The MBB solar houses - Design, operation, and experience 15 p0336 A77-39985
- The BBC Solarwatt system --- for domestic hot water supply 15 p0337 A77-39989
- Energy assessment and possibilities of remote heat supply 15 p0338 A77-40350
- Perspectives of geothermal energy in France 16 p0399 A77-40512
- Solar power in space - Energy for the year 2000 16 p0399 A77-40519
- Problems in the use of oil shale as an energy source 16 p0399 A77-40523
- Solar thermal electricity - Power tower dominates research 16 p0400 A77-40647
- Electrochemical energy conversion. II - Utilities, marine and space applications 16 p0400 A77-40686
- Investigation into the use of large-scale total-energy systems in mild and warm climates 16 p0401 A77-41318
- Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters 16 p0402 A77-41360
- Gasification - Theory and application --- of coal 16 p0402 A77-41448
- New options in energy technology; Proceedings of the Conference, San Francisco, Calif., August 2-4, 1977 16 p0402 A77-41551
- Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552
- Alternatives to oil and gas through energy management [AIAA 77-1006] 16 p0403 A77-41553
- Storage batteries - The case and the candidates [AIAA 77-1007] 16 p0403 A77-41554
- Improvement in phosphoric acid cell powerplant technology [AIAA 77-1011] 16 p0403 A77-41558
- Gas turbine HTGR - A total energy utilization option --- High Temperature Gas-cooled Reactor [AIAA 77-1016] 16 p0403 A77-41560
- Perspectives on implementing OTEC power --- Ocean Thermal Energy Conversion [AIAA 77-1024] 16 p0404 A77-41564
- Hydrogen by electrolysis to supplement pipeline gas supplies Technical and economic aspects [AIAA 77-1032] 16 p0405 A77-41569
- Hydrogen-via-Electricity - A candidate transitional transportation energy system concept [AIAA 77-1034] 16 p0405 A77-41570
- The NASA Energy Conservation Program [AIAA PAPER 77-1005] 16 p0405 A77-41571
- The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- Photovoltaics - The semiconductor revolution comes to solar 16 p0407 A77-41638
- Energy from bioconversion of waste materials --- Book 16 p0407 A77-41649
- The unitary heat pump industry - 25 years of progress 16 p0408 A77-41822
- 10 design principles for air-to-air heat pumps 16 p0408 A77-41824
- The roles of aerospace organizations in energy development or can aerospace success bring success in energy [AIAA PAPER 77-1001] 16 p0408 A77-41855
- Solar energy - Promises and pitfalls [AIAA PAPER 77-1022] 16 p0409 A77-41856
- The 'wind-wall' - An integrated wind/solar system 16 p0410 A77-42075
- Applications of superconducting magnets to energy with particular emphasis on fusion power 16 p0411 A77-42161
- The oceans as a source of electricity 16 p0412 A77-42401
- A pressurized fluidized bed coal fired combined cycle electric power generation [AIAA PAPER 77-1013] 16 p0412 A77-42482
- Large-scale space operations for Solar Power Satellites [AIAA PAPER 77-1031] 16 p0413 A77-42483
- Solar satellites - Space key to our power future 16 p0413 A77-42560
- Creating a welcome for aerospace energy technology 16 p0413 A77-42561
- Management analysis of nuclear allocation for the generation of electricity 16 p0413 A77-42590
- Electric energy alternatives appraisal for New York State 16 p0413 A77-42632
- Putting alternative sources of energy into prospective 16 p0414 A77-42633
- The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface 16 p0414 A77-42634
- An econometric analysis of energy over the next 75 years 16 p0414 A77-42637
- The prospects for renewable energy sources 16 p0415 A77-42858
- Solar power systems 16 p0416 A77-42895
- Optical performance of fixed zenith-moving azimuth paraboloid-cylindrical concentrator 16 p0417 A77-42955
- Study of thermal performance of solar heating systems with storage and auxiliary heaters 16 p0417 A77-42957
- Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern France 16 p0417 A77-42963



# SUBJECT INDEX

# ENERGY TECHNOLOGY CONTD

Wind energy - Bounty in the breeze 16 p0418 A77-43123

Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers [WSS/CI PAPER 76-25] 16 p0419 A77-43593

Prefabricated houses with an indoor swimming pool heated by a heat pump 16 p0421 A77-44448

Solar energy in tropical and subtropical countries 16 p0421 A77-44449

The heat pump - An approach for saving energy 16 p0421 A77-44450

A terrestrial solar thermal electric power system - Development of basic model system 16 p0422 A77-44478

Low-profile heliostat design for solar central receiver systems 16 p0422 A77-44480

Energy corradation using the reversible ammonia reaction --- for solar power generation 16 p0422 A77-44483

Efficient, low cost, concentrating solar collectors 16 p0423 A77-44486

Lessons learned from Atlanta /towns/ solar experiment --- solar heating and cooling for school 16 p0423 A77-44491

Global problems and energy 16 p0425 A77-44688

The utilization of solar energy in Central Europe 16 p0426 A77-45461

Solar energy in Australia 16 p0426 A77-45499

Utilization of wind energy for electrical power supplies to ESSOR stationary platforms --- tropospheric tethered balloon experiment 16 p0427 A77-45610

Underground coal gasification --- Book 16 p0428 A77-45954

Energy supply to the year 2000: Global and national studies --- Book 16 p0428 A77-46093

Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations --- Book 16 p0428 A77-46250

Some observations on the selection of gas turbine generating plant 16 p0429 A77-46413

Liquid fuels and chemical feedstocks from coal by supercritical gas extraction 16 p0429 A77-46449

A large solar heating system for a Saudi campus complex 16 p0430 A77-46550

Prospects for satellite power stations [AAS 76-058] 16 p0430 A77-46639

Space and energy; Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975 16 p0432 A77-46787

Waste resources - Problems and promise --- for urban energy conversion [ASME PAPER 77-ENAS-49] 16 p0432 A77-46890

Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26] 16 p0432 A77-46909

A supplementary fuel for power generation /Ames, Iowa/ --- solid waste recovery system 16 p0433 A77-47214

Idealization of complex dynamic systems with examples involving electrical energy systems --- Russian book 16 p0434 A77-47331

Geothermal energy - Tapping nature's boiler room 16 p0437 A77-47600

An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system 16 p0437 A77-47752

The future of hydrogen as an energy source --- nuclear-powered water electrolysis 16 p0438 A77-47848

The effect of aerofoil characteristics on windmill performance 16 p0438 A77-47880

Progress of feasibility reassessment of exploiting Fundy tidal energy 16 p0439 A77-47971

Synthetic fuels and combustion 16 p0439 A77-48159

Numerical model of coal gasification in a packed bed 16 p0440 A77-48175

Kinetics of gasification in a combustion pot - A comparison of theory and experiment 16 p0440 A77-48176

Reaction rate analysis of borehole 'in-situ' gasification systems 16 p0440 A77-48177

Solar energy installation for the project 'Motto di Lena' in Minusio/Tessin 16 p0441 A77-48257

Energy savings obtained by applying the findings of construction physics. II 16 p0441 A77-48259

Wind energy - Large and small systems competing 16 p0441 A77-48267

Underground coal gasification - A status report 16 p0441 A77-48473

BI-gas pilot plant processes 5 tph --- bituminous coal gasification 16 p0441 A77-48478

Science and technology of oil shale --- Book 16 p0442 A77-48502

Wind power - Pipe dream or reality 16 p0442 A77-48503

Shortened focusing concentrators and focusing wedges --- solar energy technology 16 p0442 A77-48521

Radiative heat transfer in cavity type axisymmetric collectors for high-temperature solar energy plants 16 p0443 A77-48523

Intersociety Energy Conversion Engineering Conference, 12th, Washington, D.C., August 28-September 2, 1977, Proceedings. Volumes 1 & 2 16 p0443 A77-48701

Comparing alternative methods of improving fuel economy --- in automobiles 16 p0443 A77-48702

The ERDA automotive gas turbine program 16 p0443 A77-48703

Improving automobile fuel economy with advanced transmissions 16 p0444 A77-48704

Synthetic carbonaceous fuels and feedstocks from oxides of carbon and nuclear power 16 p0444 A77-48711

Solid fuels from biomass - Some environmental and economic considerations 16 p0445 A77-48712

The prospects for fuels from biomass 16 p0445 A77-48713

Light commercial Brayton/Rankine space conditioning system 16 p0445 A77-48716

The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery 16 p0446 A77-48726

ERDA Fuel Cell Applied Research Program 16 p0447 A77-48736

4.8-megawatt fuel cell module demonstrator 16 p0447 A77-48738

Post-test analysis of Li/FeS2 compact cells 16 p0448 A77-48739

Recent progress in development of sodium-sulfur battery for utility application 16 p0448 A77-48740

Development status of lithium-silicon/iron sulfide load leveling batteries 16 p0448 A77-48741

Improved negative electrodes for lithium/iron sulfide batteries 16 p0448 A77-48742

Development of the High Seasonal Performance Factor Gas Heat Pump --- for space heating 16 p0448 A77-48744

Development of a Stirling engine powered heat activated heat pump 16 p0448 A77-48745

Feasibility study of an Integrated Energy/Utility System at the University of Florida 16 p0449 A77-48751

Energy savings through on-site fuel cells in industrial applications 16 p0449 A77-48752

Exact 60 cycle power generation at any speed --- for windmill applications 16 p0450 A77-48759

Environmental impact of major solar power development 16 p0452 A77-48773

Development status and environmental hazards of several candidate advanced energy systems 16 p0452 A77-48776

A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants 16 p0452 A77-48779

An environmental assessment of liquid metal topping cycles --- in coal-fired fluidized bed processors for electric power generation 16 p0452 A77-48780

An environmental assessment of a 638 MWe molten carbonate fuel cell power plant 16 p0453 A77-48781

Pressurized fluidized bed pilot plant for production of electric power using high sulfur coal 16 p0453 A77-48782

Coal fired combined cycle for electric power generation 16 p0453 A77-48783

Fluidized bed adiabatic combustor power plants - Concepts and comparisons 16 p0453 A77-48784

A unitized 500-megawatt fluidized bed boiler design 16 p0453 A77-48786

Analysis of power cycles with centrifugal fluidized bed coal combustion 16 p0453 A77-48787

Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804

Design and field test of a steam powered downhole geothermal pump 16 p0456 A77-48806

A two-phase rotary separator demonstration system for geothermal energy conversion 16 p0456 A77-48807

Performance of a total-flow impulse turbine for geothermal applications 16 p0456 A77-48808

The helical screw expander evaluation project --- for geothermal wells 16 p0456 A77-48809

Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 16 p0457 A77-48812

Development progress on the Sulfur Cycle Water Decomposition System --- for hydrogen production 16 p0457 A77-48813

Irreversibilities, heat penalties, and economics for the methanol/sulfuric acid process --- for hydrogen production 16 p0457 A77-48814

Recent developments in the engineering and chemistry of the ZnSe thermochemical hydrogen cycle 16 p0457 A77-48815

Irreversibilities in thermochemical cycles for hydrogen production by water decomposition 16 p0457 A77-48816

A new family of hydrogen storage alloys based on the system nickel-mischmetal-calcium 16 p0457 A77-48817

Hydrogen separation and production from coal-derived gases using  $\text{Fe}/x\text{Ti}/1-x$  16 p0458 A77-48821

Design of the Montana Magnetohydrodynamics Component Development and Integration Facility 16 p0458 A77-48822

Development status of the fixed mirror solar concentrator 16 p0460 A77-48834

Technology for power in space 16 p0463 A77-48865

Photovoltaic solar power satellites 16 p0463 A77-48866

Solar power satellites - A system overview 16 p0463 A77-48868

Solar power satellite concepts and potential related space systems 16 p0463 A77-48870

Design and analysis of a 5000-MW GaAlAs satellite power system 16 p0464 A77-48871

Solar power satellite construction - Issues and needed technology 16 p0464 A77-48873

The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station 16 p0464 A77-48874

Optimizing a low cost satellite energy system 16 p0465 A77-48877

Comparative assessment of orbital and terrestrial central power plants 16 p0465 A77-48878

Demonstration of a Free-Piston Stirling Linear Alternator power conversion system 16 p0465 A77-48880

A new mathematical model for Stirling cycle machines 16 p0465 A77-48884

NASA Thermionic-Conversion program 16 p0466 A77-48886

Thermionic converter studies at Thermo Electron 16 p0466 A77-48887

Thermionic converter performance with oxide collectors 16 p0466 A77-48888

Status of research on advanced thermionic converters 16 p0466 A77-48889

Low arc drop hybrid mode thermionic converter 16 p0466 A77-48890

Solar thermionic power systems for terrestrial applications 16 p0466 A77-48893

Increased central station power plant efficiency with a thermionic topping system 16 p0467 A77-48894

Experimental data and theoretical analysis of an operating 100 kW wind turbine 16 p0467 A77-48898

An assessment of wind-powered generators for navigational aids 16 p0468 A77-48900

Design and operational evaluation of a 25 kW wind turbine generator for residential heating applications 16 p0468 A77-48901

Commercial applications of solar total energy systems 16 p0468 A77-48904

Optimum operating conditions for a cylindrical parabolic focusing collector/Rankine power generation cycle system 16 p0468 A77-48905

Gaseous fuel reactors for power systems 16 p0468 A77-48906

Space construction base operations in support of solar power satellite development 16 p0468 A77-48907

Comparative evaluation of technical and economic indices for MHD and thermionic toppers for steam turbine facilities 16 p0469 A77-48909

Sharing the sun: Solar technology in the seventies; Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volumes 1-10 16 p0469 A77-48910

Overview of Canadian activities in renewable energy resources 16 p0469 A77-48912

Development and implementation of standards for solar heating and cooling applications 16 p0469 A77-48913

Recent Canadian activities in solar heating 16 p0469 A77-48915

Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923

Determination of average ground reflectivity for solar collectors 16 p0471 A77-48933

Methods for estimating total flux in the direct solar beam at any time 16 p0471 A77-48934

## SUBJECT INDEX

## ENERGY TECHNOLOGY CONTD

- Solar collectors --- for heating and cooling of buildings 16 p0471 A77-48935
- Performance and analysis of 'Solaris' water-trickle solar collector 16 p0472 A77-48939
- A site sensitive solar collector evaluator 16 p0473 A77-48947
- Reduced drag, paraboloid type, solar energy collectors 16 p0473 A77-48951
- Collector with cusplike compound parabolic concentrator and selective absorber 16 p0474 A77-48955
- Optical and thermal design considerations for ideal light collectors 16 p0474 A77-48956
- Heating of buildings with solar energy 16 p0474 A77-48959
- Coefficient of performance for solar-powered space cooling systems 16 p0475 A77-48965
- Experimental evaluation of a solar house heating system in Quebec 16 p0475 A77-48968
- Application of solar principles in designing a low cost system for warehouse heating 16 p0476 A77-48969
- A solar home for low income families 16 p0476 A77-48970
- Solar cooling of a Florida Welcome Station - A demonstration 16 p0476 A77-48973
- The Shenandoah Solar Community Center 16 p0476 A77-48974
- The Lovell Observatory experimental solar heating module 16 p0476 A77-48976
- Design and construction of a residential solar heating system at Fernilab 16 p0476 A77-48977
- Design and construction of solar space heating and hot water supply systems for experimental multi-family housing 16 p0477 A77-48979
- Solar heating in northern New England 16 p0477 A77-48980
- A hybrid solar-assisted heat pump system for residential applications 16 p0477 A77-48981
- An analysis on optimal design of solar heating and cooling system for school 16 p0477 A77-48984
- Solar assisted heat pump air conditioning system 16 p0477 A77-48985
- Operational analysis of a solar optimized heat pump 16 p0478 A77-48986
- Steady-state and transient performance limitations of the ARKLA Solair absorption cooling system 16 p0478 A77-48987
- A passive solar heated house - Design and construction 16 p0478 A77-48989
- Residential solar heating retrofit in the urban environment 16 p0478 A77-48992
- A status report on the USAFA solar energy program 16 p0478 A77-48993
- Project Sunshower - San Jose State University dormitory retrofit to solar-assisted water heating 16 p0479 A77-48996
- Solar retrofit applications for public buildings 16 p0479 A77-48997
- System performance of first residential solar installation in Charlottesville, Virginia, U.S.A. - Retrofitted indoor swimming pool 16 p0479 A77-48999
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0479 A77-49001
- Solar powered absorption air-conditioning system performance using real and synthetic weather data 16 p0479 A77-49002
- Unified simulation capability for solar heating and cooling system analysis 16 p0479 A77-49003
- A simplified method for calculating required solar collector array size for space heating 16 p0480 A77-49007
- An averaging technique for predicting the performance of a solar energy collector system 16 p0480 A77-49008
- A structural design process for solar energy systems 16 p0480 A77-49012
- Site Data Collection System for solar energy applications 16 p0480 A77-49014
- Survey of the applications of solar thermal energy to industrial process heat 16 p0481 A77-49019
- Conceptual design of an open cycle gas turbine solar central receiver system 16 p0481 A77-49022
- Salt requirement and stability of solar ponds 16 p0482 A77-49027
- A central receiver solar system applicable to central power stations 16 p0483 A77-49036
- Collector field design for a central receiver solar thermal power plant 16 p0484 A77-49039
- Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility 16 p0484 A77-49040
- Gulf Stream OTEC resource potential and environmental impact assessment overview --- Ocean Thermal Energy Conversion 16 p0485 A77-49048
- Design considerations of solar arrays for terrestrial applications 16 p0485 A77-49053
- Status of the ERDA photovoltaic materials and device studies 16 p0486 A77-49056
- Fuels and chemicals from the sun through bioconversion 16 p0488 A77-49076
- Design and performance of an air collector for industrial crop dehydration 16 p0488 A77-49078
- A feasibility study of bio-gas production in individual farms in Southwestern Ontario 16 p0489 A77-49082
- Synchronous inversion - Concept and application --- use of intermittent variable power sources to supplement primary sources 16 p0490 A77-49088
- Energy content of winds in the high plains region of southwestern U.S. 16 p0490 A77-49089
- The use of built form to enhance the output of wind collectors --- building design for wind concentration 16 p0490 A77-49090
- The application of wind power systems to the Minnesota Power and Light Company 16 p0490 A77-49092
- The Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories 16 p0491 A77-49096
- High temperature thermal energy storage 16 p0491 A77-49099
- Chemical methods of storing thermal energy 16 p0491 A77-49100
- Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- Economic study of solar total energy 16 p0494 A77-49124
- Technical and socio-economic aspects of solar energy and rural development in developing countries 16 p0494 A77-49128
- Solar high technology and architecture 16 p0495 A77-49129
- Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132
- Perceptual assessment of a new energy concept 16 p0496 A77-49138
- Report on the design, construction, and marketing of two solar heated SPEC houses 16 p0496 A77-49141
- The performance of homemade solar collectors at the Stockton State College 'Energy House' 16 p0497 A77-49151

Design, operation and economics of the Energy Plantation 16 p0497 A77-49154

Residential application of photovoltaic energy systems 16 p0497 A77-49155

On the analysis and design of grid structures for p-n junction solar cells 16 p0497 A77-49156

Initial operation of a solar heating and cooling system in a full-scale solar building test facility 16 p0498 A77-49164

Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation 16 p0498 A77-49165

Ocean wave power 16 p0499 A77-49349

Fundamental research on heat transfer performances of solar focusing and tracking collector 16 p0502 A77-50223

A technical scale gas generator for steam gasification of coal using nuclear heat 16 p0502 A77-50255

Solar energy: A U.K. assessment --- Book 16 p0503 A77-50688

Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153

Improvements in energy conversion technology 16 p0505 A77-51154

The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology 16 p0505 A77-51156

Development of new technologies for energy production in the Federal Republic of Germany 16 p0505 A77-51157

Water and energy systems - A planning model 16 p0506 A77-51279

Technical, economic, and environmental evaluation of in situ coal gasification 16 p0506 A77-51366

Heating with solar energy 16 p0506 A77-51370

Past experience - Basis for future advanced power systems for communications satellites [IAF PAPER 77-22] 16 p0506 A77-51390

Space solar power versus space communications [IAF PAPER A-77-65] 16 p0507 A77-51532

Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite 16 p0508 A77-51587

Concurrent carbon gasification and carbon deposition in chars 16 p0508 A77-51590

A new approach to planning with gas turbines [ASME PAPER 77-JPGC-GT-3] 16 p0509 A77-51623

The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification [ASME PAPER 77-JPGC-GT-7] 16 p0509 A77-51624

National petroleum product supply and demand, 1976 - 1978 [PB-254969/9] 13 p0084 A77-10224

Advances in engineering science, volume 3 [NASA-CP-2001-VOL-3] 13 p0084 A77-10305

Solar power arrays for the concentration of energy [COO-2699-2] 13 p0087 A77-10651

Energy fact book 1975. Parts 1-5: Appendixes A-H [AD-A023010] 13 p0089 A77-10664

Directory of Federal energy data sources: Computer products and recurring publications [PB-254163/9] 13 p0093 A77-10941

Hydrogen for energy storage: A progress report of technical developments and possible applications [BNL-20931] 13 p0094 A77-11201

A basis for analyzing prospective power generation in terms of environmental management and energy use 13 p0096 A77-11526

Electric energy supply alternatives for New York. Phase 2: An appraisal of electrical energy alternatives available to the State of New York [PB-249881/4] 13 p0101 A77-11575

ERDA energy information data base: Magnetic tape description [TID-4581-R3] 13 p0102 A77-11695

Inventory of energy research and development (1973 - 1975), volume 1 [GPO-64-734-VOL-1] 13 p0113 A77-13525

Inventory of energy research and development (1973 - 1975), volume 2 [GPO-64-734-VOL-2] 13 p0113 A77-13526

Inventory of energy research and development (1973 - 1975), volume 3 [GPO-64-734-VOL-3] 13 p0113 A77-13527

Inventory of energy research and development (1973 - 1975), volume 4 [GPO-64-734-VOL-4] 13 p0113 A77-13528

Heat extraction from hot dry rock masses [PB-256775/8] 13 p0116 A77-13556

Solar cell array design handbook, volume 1 [NASA-CR-149364] 13 p0118 A77-14193

Solar cell array design handbook, volume 2 [NASA-CR-149365] 13 p0118 A77-14194

Explaining energy: A manual of non-style for the energy outsider who wants in [LBL-4458] 13 p0122 A77-14592

Non-nuclear energy technology. Low temperature cable for power transmission [BNFT-PB-T-76-01] 14 p0210 A77-17372

Solar total energy program [SAND-76-0205] 14 p0211 A77-17571

Liquid phase methanol [PB-257615/5] 14 p0214 A77-17594

In-situ laser retorting of oil shale [NASA-CASE-LEW-12217-1] 14 p0214 A77-18429

Solar energy collection system [NASA-CASE-NPO-13579-2] 14 p0229 A77-20565

The 1985 technical coefficients for inputs to energy technologies [BNL-50532] 14 p0231 A77-20583

The cylindrical parabolic mirror as reflector for solar collectors. Efficiencies and optimization [DLR-PB-76-55] 14 p0233 A77-20607

Drilling for energy resources [PB-259206/1] 14 p0235 A77-20972

Status of Goldstone solar energy system study of the first Goldstone energy project 14 p0235 A77-21126

First World Hydrogen Energy Conference proceedings, volume 2 14 p0238 A77-21591

A farm energy system employing hydrogen storage 14 p0239 A77-21600

The photosynthetic production of hydrogen 14 p0239 A77-21602

First World Hydrogen Energy Conference proceedings, volume 3 14 p0243 A77-21626

Analysis of a Delphi study on hydrogen 14 p0246 A77-21649

ERDA's hydrogen programs 14 p0246 A77-21650

The NASA hydrogen energy systems technology study: A summary 14 p0246 A77-21651

Perspectives on the evolution into a hydrogen economy 14 p0246 A77-21652

Technology impact assessment of the hydrogen economy concept: Key findings 14 p0246 A77-21653

Will the large-scale production of hydrogen be part of the energy problem or part of its solution? 14 p0246 A77-21654

The Greenland hydropower as a source of electrolytic hydrogen 14 p0246 A77-21655

Hydrogen in the seaward advancement of industrial societies 14 p0246 A77-21656

Energy and the future 14 p0246 A77-21657

Hydrogen use projections and supply options 14 p0247 A77-21658

US options for a transition from oil and gas to synthetic fuels 14 p0247 A77-21661

Energy model data base program [BNL-21545] 14 p0250 A77-21687

- Proceedings of 2nd Workshop on Materials Problems  
Associated with the Development of Geothermal  
Energy Systems  
[PB-261349/5] 14 p0252 N77-21725
- Method for producing solar energy panels by  
automation  
[NASA-CASE-LEW-12541-1] 15 p0344 N77-22615
- Energy and technology review  
[UCRL-52000-76-8] 15 p0345 N77-22627
- Geothermal Energy and Wind Power: Alternate  
energy sources for Alaska  
[PB-261521/9] 15 p0349 N77-22678
- ERDA Interlaboratory Work for Data Exchange (IWGDE)  
[LBL-5329] 15 p0352 N77-22998
- Site energy handbook. Volume 2: Forms for energy  
survey and appraisal  
[ERDA-76-131/2] 15 p0355 N77-23608
- Factors in the planning of a national information  
system for renewable energy  
[PB-262003/7] 15 p0358 N77-24002
- The cylindrical parabolic mirror as reflector for  
solar collectors-efficiencies and optimization  
[ESA-TT-365] 15 p0365 N77-24615
- Study to assess the application of shadow pricing  
techniques to national energy resource planning  
[BNL-50537] 15 p0369 N77-24997
- Energy research: Alternative strategies for  
development of new energy technologies and their  
implications for the Federal budget  
[PAPER-10] 15 p0372 N77-25632
- Energy in Perspective: An orientation conference  
for educators  
[CONF-760677] 15 p0373 N77-25648
- Optical study of fixed spherical solar collectors  
[LAS-PRC-76-01] 15 p0373 N77-25653
- Report of the subcommittee on energy-related  
atomic and molecular science  
[PB-264052/2] 15 p0375 N77-25673
- Energy and physics  
[ERDA-TR-225] 15 p0386 N77-26916
- Technology and use of low-rank coals in the USA  
[CONF-760495-1] 15 p0392 N77-27519
- Assessment of energy storage technologies and  
systems. Phase 1: Electric storage heating,  
storage air conditioning, and storage hot water  
heaters  
[ANL-ES-54] 15 p0394 N77-27547
- Energy and technology review --- measurement of  
lunar subsurface temperature and monitoring of  
atmospheric ozone  
[UCRL-52000-76-11] 15 p0396 N77-27651
- Fusion. The future energy source  
[AEOL-10] 15 p0397 N77-27951
- Energy accumulation through stationary flywheel  
systems  
[BNFT-PE-T-76-58] 16 p0522 N77-29620
- Energy fact book, 1977 --- energy sources,  
technology, and conservation  
[AD-A038802] 16 p0522 N77-29624
- Input-Output capital coefficients for energy  
technologies  
[BNL-50608] 16 p0524 N77-30027
- Proceedings of the ASPE/MSFC Symposium on  
Engineering and Productivity Gains from Space  
Technology  
[NASA-CP-2019] 16 p0525 N77-30273
- ERDA/NASA-MSFC solar heating and cooling  
development and demonstration program  
16 p0525 N77-30274
- Impact of alternative energy forms on public  
utilities  
16 p0525 N77-30275
- Ocean Thermal Energy Conversion (OTEC)  
16 p0526 N77-30278
- Environmental effects of energy production and  
utilization in the US. Volume 1: Sources,  
trends and costs of control  
[UCRL-51930-VOL-1] 16 p0530 N77-30645
- Hydrogen generation process  
[PE-2262-3] 16 p0533 N77-31337
- Solar Collection Module Test Facility,  
instrumentation fluid loop number one  
[SAND-76-0425] 16 p0535 N77-31619
- Natural gas massive hydraulic fracture research  
and advanced technology project  
[SAND-76-0723] 16 p0536 N77-31630
- Energy Technologies for the West: Can the  
Individual's Voice be Heard; Public  
Participation in Energy Planning  
[TID-27433] 16 p0537 N77-31643
- Energy technologies for the west: What impact  
could energy technology development have on the  
quality of life  
[TID-27428] 16 p0538 N77-31645
- Research and development in enhanced oil recovery.  
Part 2: The program  
[ERDA-77-20/2] 16 p0538 N77-31650
- Research and development in enhanced oil recovery.  
Part 3: The methodology  
[ERDA-77-20/3] 16 p0538 N77-31651
- Solar energy collection system  
[NASA-CASE-WFO-13810-1] 16 p0545 N77-32582
- High efficiency thermionic converter studies  
[NASA-CR-135263] 16 p0546 N77-32592
- National energy projections and plans of the USA  
[IAEA-CN-36/397] 16 p0548 N77-32619
- Energy in an oasis: Geothermal resource  
development in the Imperial Valley of California  
16 p0552 N77-33598
- Advanced Thermal Energy Storage (TES) systems  
[EPRI-EM-256-SI] 16 p0555 N77-33622
- Geophysical fluid dynamics background for ocean  
thermal power plants  
[DSE/1005-1] 16 p0555 N77-33624
- Technical and economic feasibility of solar  
augmentation for boiler feedwater heating in  
steam-electric power plants  
[COO-2864-1] 16 p0555 N77-33626
- Proceedings of the ERDA Semiannual Solar  
Photovoltaic Program Review Meeting  
[CONF-760837-P2] 16 p0555 N77-33628
- Sandia Laboratories energy programs  
[SAND-77-0034] 16 p0555 N77-33629
- Energy technologies for the west: Possible  
effects of Energy Technology on Land, Water, and  
Air Resources  
[TID-27444] 16 p0556 N77-33632
- Role of renewable energy technologies in  
developing countries  
[BNL-22311] 16 p0556 N77-33638
- Energy and protein production from pulp mill wastes  
[COO-2983-2] 16 p0557 N77-33645
- Interagency energy/environment research and  
development program: Status report 3  
[PB-267443/0] 16 p0558 N77-33662
- Energy interrelationships. A handbook of tables  
and conversions factors for combining and  
comparing international energy data  
[PB-269034/5] 16 p0559 N77-33675
- Energy options open to mankind beyond the turn of  
the century  
[IAEA-CN-36/538] 16 p0560 N77-33679
- ENERGY TRANSFER**  
Geothermal energy --- conversion technology  
development  
13 p0005 A77-11035
- Applied solar energy: An introduction /2nd edition/  
--- Book  
15 p0286 A77-33445
- Progress in switching technology for NETS systems  
--- Magnetic Energy Transfer and Storage  
15 p0303 A77-36377
- International energy evaluation system  
15 p0319 A77-38216
- Transmission of power from space to earth  
[AIAA 77-1026] 16 p0404 A77-41566
- Recovery of energy from fracture-stimulated  
geothermal reservoirs  
16 p0424 A77-44604
- Compressed air storage for load leveling of  
nuclear power plants  
16 p0459 A77-48826
- A generalized numerical model for predicting  
energy transfers and performance of large solar  
ponds  
16 p0482 A77-49025
- Energy and Physics: General Conference of the  
European Physical Society  
[AD-A026962] 13 p0131 N77-15511
- Thermodynamic analysis of alternate energy  
carriers, hydrogen and chemical heat pipes  
14 p0240 N77-21608
- Statistics of the radiated field of a  
space-to-earth microwave power transfer system  
[NASA-TN-X-73684] 16 p0526 N77-30314

- An analytical and experimental investigation of a  
1.8 by 3.7 meter Fresnel lens solar concentrator  
[NASA-TP-1005] 16 p0529 A77-30617
- Fluid dynamic energy conversion and transfer  
processes  
[AD-A040589] 16 p0533 A77-31444
- ENGINE CONTROL**  
The M-14F aircraft engine --- Russian book  
15 p0320 A77-38300
- ENGINE COOLANTS**  
Fuel economy potential of a combined engine  
cooling and waste heat driven automotive  
air-conditioning system  
13 p0020 A77-12665
- ENGINE DESIGN**  
Equation solution accuracy in calculating jet  
engine characteristics  
13 p0020 A77-12502
- Heat-pipe regenerator for gas turbine engine  
13 p0020 A77-12528
- A conceptual design study of closed Brayton cycle  
gas turbines for fusion power generation  
13 p0022 A77-12676
- Comparison of geothermal power conversion cycles  
13 p0030 A77-12750
- A guide for the conversion to and maintenance of  
hydrogen-fueled, spark-ignited engines  
13 p0033 A77-12779
- Performance of a hydrogen-powered  
transit vehicle  
13 p0033 A77-12781
- The Stirling engine - Engineering considerations  
in view of future needs  
13 p0041 A77-12842
- Self-starting, intrinsically controlled Stirling  
engine  
13 p0041 A77-12844
- Evolution of the concept of the automobile from  
the standpoint of saving energy  
13 p0051 A77-14562
- Thermodynamic analysis and selection of optimal  
parameters of a dynamic converter for a solar  
energy set-up --- utilizing Stirling engine  
13 p0051 A77-14580
- Application of simulation studies to the design  
and improvement of fuel control systems for  
aviation turbine engines  
13 p0054 A77-15798
- Pressure ratio optimization criteria in aircraft  
turbojet-engines design  
13 p0062 A77-17258
- Variable geometry for high performance aircraft  
engines  
13 p0062 A77-17264
- Theoretical aspects of optimization of aviation  
gas turbine engine design variables  
13 p0063 A77-17762
- Analysis of parameters and characteristics of a  
bypass turbojet engine operating in a cycle with  
stepwise heat removal  
13 p0063 A77-17765
- Hydrogen as a fuel in compression  
ignition engines  
13 p0071 A77-18932
- Amtrak's newest turboliners  
14 p0138 A77-20699
- Air transport propulsion for the 1980's  
14 p0138 A77-20717
- Small gas turbines and the Total Energy concept  
14 p0156 A77-22024
- Comparison of electric drives for road vehicles  
14 p0162 A77-22918
- Hybrid propulsion system for motor vehicles with  
predominantly intermittent mode of operation  
14 p0171 A77-23900
- An engine designer's view for advanced secondary  
power systems  
[AIAA PAPER 77-517] 14 p0174 A77-23931
- A new 10,000-hp gas turbine engine for industrial  
service  
[ASME PAPER 77-GT-4] 14 p0197 A77-28524
- Future propulsion plants. I  
15 p0268 A77-32251
- Whatever happened to the Wankel engine  
15 p0272 A77-33125
- An Otto for the automobile. II --- comparing  
engines utilizing different configurations and  
thermodynamic cycles  
15 p0273 A77-33302
- Automotive fuel-saving system with on-board  
hydrogen generation and injection into I. C.  
engines  
15 p0280 A77-33384
- Prototype hydrogen automobile using a metal hydride  
15 p0282 A77-33398
- A hydrogen-powered mass transit system  
15 p0282 A77-33400
- Use of hydrogen in automotive engines  
15 p0283 A77-33401
- Development of low-power gas turbines with  
regenerative heat exchangers at MTU. I  
15 p0289 A77-34122
- Volkswagen develops a diesel  
15 p0290 A77-34630
- Thermodynamic analysis and choice of optimal  
parameters of dynamic converter for solar energy  
plant --- utilizing Stirling engine  
15 p0291 A77-34974
- The interaction of automotive-engine efficiency  
and exhaust pollution  
15 p0296 A77-35922
- Advanced motor developments for electric vehicles  
15 p0305 A77-36615
- The M-14P aircraft engine --- Russian book  
15 p0320 A77-38300
- Influence of atmospheric conditions on the  
parameters of a turbojet engine  
15 p0323 A77-39270
- New developments on VW-PCI and VW-PCV stratified  
charge engine concepts --- Pre-Chamber-Injection  
and Pre-Chamber-Valve combustion processes  
16 p0401 A77-41257
- The development of small regenerative gas turbines  
at MTU. II  
16 p0401 A77-41258
- Advanced supersonic transport propulsion  
requirements  
[AIAA PAPER 77-831] 16 p0410 A77-41969
- Effects of exhaust manifold configuration on a  
turbocharged engine employing charge  
stratification  
[SAE PAPER 770047] 16 p0424 A77-44557
- Design considerations on a thermal energy storage  
Stirling engine automobile  
[SAE PAPER 770080] 16 p0424 A77-44558
- The development of a 150 kW /200 HP/ Stirling  
engine for medium duty automotive application -  
A status report  
[SAE PAPER 770081] 16 p0424 A77-44559
- Design of the 4-215 D.A. automotive Stirling engine  
[SAE PAPER 770082] 16 p0424 A77-44560
- Gas turbines - Status and prospects; Proceedings  
of the Symposium, London, England, February 4,  
5, 1976  
16 p0428 A77-46401
- Gas turbine evolution  
16 p0429 A77-46402
- Designing gas turbines for the industrial and  
marine field  
16 p0429 A77-46404
- The industrial gas turbine - Its status and  
prospects  
16 p0429 A77-46408
- A new maintenance concept applied in the design of  
a new industrial gas turbine in the 100 MW class  
16 p0429 A77-46410
- Development of a small, low cost turbojet engine  
with thrust augmentation --- for RPV  
16 p0434 A77-47347
- Flywheel hybrid power trains. I - Component and  
drive selection. II - Numerical optimization and  
operation  
16 p0438 A77-47968
- Combustion technology for the improvement of  
engine efficiency and emission characteristics  
16 p0440 A77-48172
- Further Stirling engine development work. I  
16 p0442 A77-48496
- The ERDA automotive gas turbine program  
16 p0443 A77-48703
- Conceptual design of closed Brayton cycle for  
coal-fired power generation  
16 p0445 A77-48714
- System evaluation of aircraft-derivative gas  
turbines for naval ship propulsion applications  
16 p0445 A77-48718

- A ceramic heat exchanger for exhaust fired gas turbine power cycles 16 p0445 A77-48719
- ERDA/F&WA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology 16 p0446 A77-48721
- Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723
- Thermal oscillators --- free piston valveless closed cycle Stirling or Ericsson cycle thermal machines 16 p0465 A77-48879
- Demonstration of a Free-Piston Stirling Linear Alternator power conversion system 16 p0465 A77-48880
- A new ported constant volume external heat supply regenerative cycle --- for Stirling cycle engines 16 p0465 A77-48885
- A solar/Stirling total energy system 16 p0481 A77-49021
- Development of a turbine rotor of silicon nitride 16 p0503 A77-50651
- Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 A77-21634
- Prototype hydrogen automobile using a metal hydride 14 p0244 A77-21636
- Variable Geometry and Multicycle Engines [AGARD-CP-205] 15 p0339 A77-22112
- Advanced engine design concepts and their influence on the performance of multi-role combat aircraft 15 p0339 A77-22116
- Variable cycle engine applications and constraints --- for commercial and military (fighter) aircraft 15 p0339 A77-22125
- Variable geometry in the gas turbine - the variable pitch fan engine 15 p0339 A77-22128
- Experience with a one stage variable geometry axial turbine 15 p0340 A77-22143
- Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 A77-26134
- Assessment of the role of the liquefied petroleum gas (LPG) engine in stage carriage service vehicles [TT-7605] 16 p0519 A77-29320
- ENGINE PARTS**
- High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591
- High temperature gas turbine engine component materials testing program [FE-1765-7] 13 p0127 A77-15401
- Study and program plan for improved heavy duty gas turbine engine ceramic component development [NASA-CR-135230] 16 p0542 A77-32033
- ENGINE STARTERS**
- Investigating the starting modes of the GT-35 gas turbine plant --- turbocompressor tests 16 p0426 A77-45324
- ENGINE TESTS**
- Performance and NOx emissions modeling of a jet ignition prechamber stratified charge engine [SAE PAPER 760161] 13 p0016 A77-12150
- Noise mechanism separation and design considerations for low tip-speed, axial-flow fans 13 p0046 A77-13339
- Water induction in hydrogen-powered IC engines 14 p0171 A77-23721
- Dynamic tests of hydrogen-powered IC engines 15 p0282 A77-33395
- Testing the annular combustor of the NK-8 aero-engine on natural gas --- for stationary gas turbine installation 16 p0426 A77-45325
- Performance characteristics of a diesel engine using low- and medium-energy gases as a fuel supplement (fumigation) [NASA-TM-X-58188] 13 p0126 A77-14955
- Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 A77-26134
- ENGINEERING**
- Advances in engineering science, volume 3 [NASA-CP-2001-VOL-3] 13 p0084 A77-10305
- ENGINES**
- Baseline gas turbine development program [COO-2749-15] 15 p0390 A77-27410
- ENGLAND**
- Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany [ANL-ES-50] 15 p0365 A77-24612
- ENTHALPY**
- On enthalpy management in small buildings --- energy storage and conservation in residential structures 14 p0194 A77-27354
- Estimation of net enthalpies of combustion of some aviation fuels expressed in the international system of units (SI) [NBS-TN-937] 16 p0550 A77-33370
- ENTRAINMENT**
- Investigation of counterflow shear effects in heat pipes [AIAA PAPER 77-749] 15 p0311 A77-37262
- Investigation of performance limits in axial groove heat pipes [NASA-CR-137912] 13 p0095 A77-11340
- ENTROPY**
- Evaluation of energy policy 16 p0415 A77-42859
- Computing residuals in geothermal research by I.R. scanning 16 p0431 A77-46768
- ENVIRONMENT EFFECTS**
- Studies and thoughts on nuclear reactor systems 13 p0055 A77-15800
- Environment and energy production after the year 2000 13 p0056 A77-16203
- Effects of anthropogenic emissions on climate - A review of selected topics 13 p0067 A77-18295
- Relative hazard of nuclear power stations and fossil-fuel power stations to the environment 13 p0067 A77-18323
- Energy and environmental impacts of materials alternatives - An assessment of quantitative understanding 13 p0070 A77-18738
- Space power systems - What environmental impact 14 p0146 A77-21757
- Electric delivery vans above the 45th parallel in North America 14 p0162 A77-22917
- Hardened solar photovoltaics [AIAA PAPER 77-484] 14 p0172 A77-23904
- Future energy production systems: Heat and mass transfer processes. Volume 2 --- Book 14 p0174 A77-24201
- Environmental considerations of converting fossil-fueled power plants from oil or natural gas to coal 14 p0181 A77-26043
- Environmental impact of space manufacturing [AIAA PAPER 77-539] 15 p0266 A77-32062
- Combined studies of the sun and isotope ecology 15 p0271 A77-32868
- Technical and environmental aspects of underground hydrogen storage 15 p0279 A77-33379
- Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449
- Institutional and environmental aspects of geothermal energy development 15 p0291 A77-35016
- Energy and the environment; Proceedings of the Third National Conference, Oxford, Ohio, September 29-October 1, 1975 15 p0291 A77-35146
- Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157

- Emission and deposition of petrol engine exhaust  
Pb. I - Deposition of exhaust Pb to plant and  
soil surfaces 15 p0333 A77-39655
- An engineering, geological and hydrological  
environmental assessment of a 250 MMSCFD dry ash  
Lurgi coal gasification facility 16 p0418 A77-43143
- The ecology of a marine littoral receiving  
effluents from a petroleum refinery 16 p0433 A77-47173
- Steam recovery - An alternative for intermediate  
size regions --- solid waste disposal 16 p0434 A77-47222
- Solid fuels from biomass - Some environmental and  
economic considerations 16 p0445 A77-48712
- Environmental impact of major solar power  
development 16 p0452 A77-48773
- Development status and environmental hazards of  
several candidate advanced energy systems 16 p0452 A77-48776
- Environmental considerations in advanced energy  
conversion technology assessments 16 p0452 A77-48777
- Environmental assessment of advanced energy  
conversion technologies 16 p0452 A77-48778
- A comparison of the environmental impact of  
conventional and fluid bed boilers in advanced  
steam power plants 16 p0452 A77-48779
- An environmental assessment of a 638 MWe molten  
carbonate fuel cell power plant 16 p0453 A77-48781
- Gulf Stream OTEC resource potential and  
environmental impact assessment overview ---  
Ocean Thermal Energy Conversion 16 p0485 A77-49048
- Assessment of the socio-economic and environmental  
aspects of the central receiver power plants 16 p0494 A77-49122
- Technical, economic, and environmental evaluation  
of in situ coal gasification 16 p0506 A77-51366
- Fuels and fuel additives for highway vehicles and  
their combustion products. Guide to evaluation  
of their potential effects on health  
[PB-254088/8] 13 p0084 N77-10222
- Summary of EPA energy policy analysis  
[PB-253361/0] 13 p0089 N77-10669
- Final assessment of the environmental impacts of  
the State Energy Conservation Program (Public  
law 94-163, Title III, part C, The Energy Policy  
and Conservation Act) 13 p0116 N77-13555
- Overview of the Imperial Valley environmental  
project [UCID-17067] 13 p0132 N77-15533
- Environmental effects of solid waste as a  
supplemental fuel [IS-3852] 14 p0211 N77-17567
- Standards support and environmental impact  
statement. Volume 1: Proposed standards of  
performance for petroleum refinery sulfur  
recovery plants [PB-257975/3] 14 p0213 N77-17647
- Proposed energy conservation contingency plan:  
Emergency heating, cooling and hot water  
restrictions. Economic impact analysis.  
Environmental impact assessment [PB-258624/6] 14 p0217 N77-18584
- Potential environmental impacts of solar heating  
and cooling systems [PB-259970/2] 14 p0226 N77-19683
- A study of the efficiency of hydrogen liquefaction 14 p0240 N77-21611
- Technical and environmental aspects of underground  
hydrogen storage 14 p0242 N77-21613
- Atmospheric impacts of evaporative cooling systems  
[ANL-ES-53] 15 p0367 N77-24643
- A process for coastal resource management and  
impact assessment [PB-264811/1] 15 p0376 N77-26004
- Oversight hearings on the SST [GPO-76-492] 15 p0376 N77-26107
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 4: Petroleum refining industry report  
[PB-264270/0] 15 p0384 N77-26681
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 5: Pulp and paper industry report  
[PB-264271/8] 15 p0384 N77-26682
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 6: Olefins industry report  
[PB-264272/6] 15 p0384 N77-26683
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 7: Ammonia industry report  
[PB-264273/4] 15 p0384 N77-26684
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 8: Alumina/aluminum industry report  
[PB-264274/2] 15 p0384 N77-26685
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 9: Textile industry report  
[PB-264275/9] 15 p0384 N77-26686
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 10: Cement industry report  
[PB-264276/7] 15 p0384 N77-26687
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 11: Glass industry [PB-264277/5] 15 p0384 N77-26688
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 N77-26690
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 14: Primary copper industry report  
[PB-264280/9] 15 p0385 N77-26691
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 15: Fertilizer industry report  
[PB-264281/7] 15 p0385 N77-26692
- Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 1: Digest of detailed data  
base descriptions [UCID-17316-PT-1] 15 p0387 N77-27036
- Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 2: Detailed data base  
descriptions [UCID-17316-PT-2] 15 p0387 N77-27037
- Environmental effects of energy production and  
utilization in the US. Volume 1: Sources,  
trends and costs of control [UCRL-51930-VOL-1] 16 p0530 N77-30645
- Environmental assessment of geopressured waters  
and their projected uses [PB-268289/6] 16 p0544 N77-32579
- Ecological considerations of the solar alternatives  
[LBL-5927] 16 p0558 N77-33655
- ENVIRONMENT MANAGEMENT**
- Controlled tipping of combustion residues 13 p0008 A77-11175
- Control of air pollution sources --- Book 16 p0419 A77-43522
- The exploration, development, and production of  
Naval Petroleum Reserve Number 4 [PB-255947/4] 13 p0124 N77-14610
- A process for coastal resource management and  
impact assessment [PB-264811/1] 15 p0376 N77-26004
- ENVIRONMENT MODELS**
- General Motors Sulfate Dispersion Experiment -  
Assessment of the EPA HIWAY model 13 p0071 A77-18882
- Advances in engineering science, volume 3  
[NASA-CP-2001-VOL-3] 13 p0084 N77-10305
- Regional land use and energy modeling  
[BNL-21809] 15 p0378 N77-26595
- ENVIRONMENT POLLUTION**
- Environmental aspects of energy conversion and use  
13 p0006 A77-11044



# SUBJECT INDEX

# ENVIRONMENTAL SURVEYS

- Energy and environment post-2000 13 p0050 A77-14560
- Tracking pollutants from a distance 13 p0067 A77-18370
- Environmental aspects of coal conversion plant siting and cost of pollution control 14 p0192 A77-27293
- Formation of sulfuric anhydride and nitrogen oxides in boilers at variable operating modes 15 p0272 A77-33174
- Use of hydrogen in automotive engines 15 p0283 A77-33401
- Emissions from compressor stations --- noise pollution 15 p0287 A77-33545
- Energy technology assessment - Considerations of geographical scale 15 p0309 A77-36822
- Environmental studies of the St. Louis-Union Electric refuse firing demonstration 15 p0315 A77-37669
- Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- Production and processing of US tar sands: An environmental assessment [PB-266266/6] 16 p0513 A77-28575
- ENVIRONMENT PROTECTION**
  - Low-sulfur coal obtained by chemical desulfurization followed by liquefaction 13 p0008 A77-11242
  - Clean air protection and industrial development 13 p0010 A77-11303
  - The conservation of air purity and its effect on the energy economy 13 p0049 A77-13811
  - The role of gas utilization in environmental protection 15 p0265 A77-31849
  - The EPA role in energy research and development 15 p0291 A77-35148
  - Underground gasification --- of coal for deep deposit in situ processing 15 p0308 A77-36813
  - EPA's program in environmental research in wastes-as-fuel 15 p0315 A77-37668
  - An application of the economic-environmental power dispatch --- decision approach for controlling air pollution emission from electric power generation 15 p0317 A77-38121
  - Development of cumulative noise measure for the prediction of general annoyance in an average population 15 p0320 A77-38497
  - Strategy of pollution control --- Book 16 p0400 A77-40673
  - Utility views of MHD power generation [AIAA 77-1010] 16 p0403 A77-41557
  - The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report [SAE PAPER 770081] 16 p0424 A77-44559
  - A study of the effects of new transportation systems on urban transportation and environment by computer simulation 16 p0430 A77-46652
  - Draft environmental assessment of application by ERDA for a special land use permit for use of public lands in Wyoming for in situ coal gasification experiments [UCID-17011] 13 p0100 A77-11572
  - Environmental impact studies related to underground coal gasification [TID-27003] 13 p0100 A77-11573
  - Research to anticipate environmental impacts of changing resource usage [PB-256253/2] 13 p0101 A77-11602
  - Evaluation of the potential environmental effects of wind energy system development [ERDA/NSF-07378/75/1] 15 p0382 A77-26663
  - Environmental considerations of selected energy conserving manufacturing process options. Volume 2: Industry priority report [PB-264268/4] 15 p0383 A77-26679
  - Western energy/environment monitoring study: Planning and coordination summary [PB-266256/7] 16 p0523 A77-29632
- Interagency energy/environment research and development program: Status report 3 [PB-267443/0] 16 p0558 A77-33662
- ENVIRONMENT SIMULATION**
  - Test results on the spinel electrode module in laboratory and simulated MHD environment 14 p0140 A77-21227
  - Simulation and cost optimization of solar heating of buildings in adverse solar regions 14 p0180 A77-25897
  - Slag flow and current transport in a simulated generator environment 15 p0330 A77-39562
- ENVIRONMENTAL CONTROL**
  - Design application using solar energy to control the environment in a major office building 14 p0168 A77-23442
  - Solar energy - Where are the opportunities --- climate control equipment manufacture 15 p0307 A77-36799
  - Space construction base support requirements for environmental control and life support systems [ASME PAPER 77-ENAS-44] 16 p0432 A77-46885
  - Introduction: Man and his total environment 16 p0544 A77-32554
- ENVIRONMENTAL ENGINEERING**
  - Environmentally designed housing incorporating solar energy 13 p0079 A77-19115
  - Solar heating projects at the Institute for Environmental Research --- in Austria 13 p0079 A77-19119
  - Northeastern utilities are meeting the clean air challenge 16 p0424 A77-44612
  - Waste heat vs conventional systems for greenhouse environmental control: An economic assessment [ORNL-TM-5069] 13 p0088 A77-10656
  - Energy technologies for the west: What impact could energy technology development have on the quality of life [TID-27428] 16 p0538 A77-31645
- ENVIRONMENTAL MONITORING**
  - Utilization of remote sensing techniques to detect land use effects on wildland water quality 13 p0071 A77-18984
  - Use of Landsat data for the detection of marine oil slicks --- for oil exploration and pollution control 15 p0267 A77-32244
  - Methods in environmental sampling for radionuclides [UCRL-77722] 13 p0091 A77-10697
  - Coal gasification commercial concepts: Gas cost guidelines [FE-1235-1] 13 p0130 A77-15500
  - Environmental assessment sampling and analytical strategy program --- industrial wastes [PB-261259/6] 15 p0352 A77-23021
- ENVIRONMENTAL QUALITY**
  - Overview of the Imperial Valley environmental project [UCID-17067] 13 p0132 A77-15533
  - Coal conversion: Description of technologies and necessary biomedical and environmental research [ORNL-5192] 15 p0392 A77-27520
  - Supply of liquefied natural gas to the Northeast [BNL-50556] 15 p0392 A77-27521
  - Hawaii technology utilization experiment [UCID-17343] 15 p0398 A77-28038
  - Long-term natural resource availability: Environmental and political implications in the United States [PB-265762/5] 16 p0511 A77-28327
- ENVIRONMENTAL SURVEYS**
  - Introductory remarks on space observations of long-term climatic changes produced by escalating energy use [IAF PAPER A-77-01] 16 p0507 A77-51508
  - Baseline energy forecasts and analysis of alternative strategies for airline fuel conservation [PB-255351/9] 13 p0091 A77-10690
  - Identification and analysis of mid-Atlantic onshore OCS impact [PB-254925/1] 13 p0096 A77-11516
  - Strategic petroleum reserve [PB-255476/4] 13 p0098 A77-11546

- Crude supply alternatives for the Northern Tier states. Volume 1: Executive summary  
[PB-255992/0] 13 p0107 N77-12531
- Crude supply alternatives for the Northern Tier states. Volume 2: Technical report  
[PB-255993/81] 13 p0107 N77-12532
- Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary  
[PB-255994/6] 13 p0107 N77-12533
- Impacts of synthetic liquid fuel development. Automotive market. Volume 2  
[PB-255995/3] 13 p0108 N77-12534
- Outlook for research and development in the underground gasification of coal  
[PB-256155/3] 13 p0109 N77-12555
- Proceedings: Symposium on Flue Gas Desulfurization, volume 1  
[PB-255317/0] 13 p0110 N77-12597
- Second Environmental Aspects of Fuel Conversion Technology Symposium  
[PB-257182/6] 13 p0125 N77-14645
- Proceedings of National Conference on Health, Environmental Effects, and Control Technology of Energy Use  
[PB-256845/9] 14 p0208 N77-16453
- Environmental survey of the reprocessing and waste management portions of the LWR fuel cycle: A task force report  
[PB-258316/9] 14 p0209 N77-16879
- Standards support and environmental impact statement. Volume 1: Proposed standards of performance for petroleum refinery sulfur recovery plants  
[PB-257575/3] 14 p0213 N77-17647
- Balanced program plan. Volume 4: Coal conversion [ORNL-5123-VOI-4] 14 p0216 N77-18566
- Geotechnical environmental aspects of geothermal power generation Heber, Imperial Valley, California  
[PB-260848/7] 15 p0349 N77-22680
- Strategic petroleum reserve draft environmental impact statement for Central Rock Mine  
[PB-262390/8] 15 p0362 N77-24572
- Strategic petroleum reserve. Bryan Mound salt dome  
[PB-262839/4] 15 p0362 N77-24579
- Strategic petroleum reserve. west hackberry salt dome  
[PB-262508/5] 15 p0362 N77-24580
- A framework for assessing environmental impacts of possible Antarctic mineral development, part 1  
[PB-262750/3] 15 p0368 N77-24709
- Energy recovery from municipal solid waste, an environmental and safety mini-overview survey [ATR-76 (7518)-7] 15 p0369 N77-25011
- EPA and ERDA high-temperature/high-pressure particulate control programs  
[PB-266231/0] 16 p0517 N77-28644
- The environmental effects of using coal for generating electricity  
[PB-267237/6] 16 p0524 N77-29655
- Methodology for the analysis of the impacts of electric power production in the West  
[LA-6720-PR] 16 p0533 N77-31428
- Alluvial valley floors in east-central Montana and their relation to strippable coal reserves. A reconnaissance report  
[PB-267280/6] 16 p0540 N77-31725
- Energy technologies for the west: Possible effects of Energy Technology on Land, Water, and Air Resources  
[TID-27444] 16 p0556 N77-33632
- ENZYME ACTIVITY**  
Enzymatic hydrolysis of cellulosic wastes to fermentable sugars for alcohol production  
15 p0315 A77-37666
- EPITAXY**  
Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509
- Large-area high-efficiency AlGaAs-GaAs solar cells  
15 p0259 A77-30738
- High-efficiency and high-peak-power InP transferred-electron oscillators  
15 p0289 A77-34366
- High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition  
16 p0408 A77-41741
- Analysis of epitaxial drift field N on P silicon solar cells  
[NASA-TN-X-73563] 13 p0106 N77-12523
- EPOXY RESINS**  
Encapsulation of solar cell modules  
13 p0076 A77-19092
- EQUIPMENT SPECIFICATIONS**  
Tests of oil recovery devices in broken ice fields, phase 2  
[AD-A025748] 13 p0110 N77-12572
- Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on)  
[NASA-CR-150152] 13 p0127 N77-15347
- Geothermal component test facility  
[TID-27035] 14 p0211 N77-17580
- EQUIVALENCE**  
Equivalence of electricity and fuels - Contributing elements to a critical discussion  
15 p0263 A77-31573
- EROSION**  
Diffuse thermal model of electrode erosion for MHD generators  
13 p0049 A77-14319
- Oxidation-erosion of materials in high velocity hot gases  
15 p0270 A77-32604
- ERROR ANALYSIS**  
The linear Fresnel lens solar concentrator: Transverse tracking error effects  
[NASA-CR-2889] 16 p0521 N77-29606
- ESTUARIES**  
Energy analysis and the coupling of man and estuaries  
15 p0290 A77-34449
- ETCHING**  
On black solar cells or the tetrahedral texturing of a silicon surface  
13 p0004 A77-11000
- ETHYL ALCOHOL**  
Alcohol - A Brazilian answer to the energy crisis --- automobile fuel from manioc  
14 p0145 A77-21673
- Enzymatic hydrolysis of cellulosic wastes to fermentable sugars for alcohol production  
15 p0315 A77-37666
- Cassava fuel alcohol in Brazil  
16 p0444 A77-48707
- Exhaust and evaporative emission from a Brazilian Chevrolet fueled with ethanol-gasoline blends  
16 p0444 A77-48708
- ETHYLENE**  
Economics of ethylene production via pyrolysis of coal based Fischer-Tropsch hydrocarbons  
15 p0301 A77-36339
- ETHYLENE COMPOUNDS**  
Inhibited ethylene glycol as the solar nexus  
15 p0270 A77-32601
- EUROPE**  
The utilization of solar energy in Central Europe  
16 p0426 A77-45461
- Europe's changing energy relations  
[R-2086-ISA] 16 p0553 N77-33610
- EUROPEAN COMMUNICATIONS SATELLITE**  
Antenna design for offshore satellite links  
16 p0442 A77-48493
- EUROPIUM**  
Hydrogen quantum yields in the 360 nm photolysis of Eu<sup>2+</sup> solutions and their relationship to photochemical fuel formation  
16 p0501 A77-50203
- EUTECTIC ALLOYS**  
Thermal storage in metals  
16 p0492 A77-49105
- EVACUATING (VACUUM)**  
Reliability study of vapor recovery systems at service stations  
[PB-267613/8] 16 p0560 N77-33700
- EVALUATION**  
Site energy handbook. Volume 1: Methodology for energy survey and appraisal  
[ERDA-76-131/1] 15 p0355 A77-23607
- Evaluation of current surface coal mining overburden handling techniques and reclamation practices  
[PB-264111/6] 15 p0372 A77-25625

## EVAPORATION

Evaporation of solution droplets in a high-temperature medium --- potassium carbonate MHD flow properties

13 p0046 A77-13254

Evaporation of a drop of solution in a high-temperature medium --- potassium carbonate MHD flow properties

15 p0263 A77-31534

## EVAPORATIVE COOLING

The problem of use of solar energy specific features of radiative, heat, and mass transfer in solar installations

13 p0057 A77-16204

Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions

15 p0286 A77-33435

A structured surface for high performance evaporative heat transfer

[AIAA PAPER 77-778]

15 p0312 A77-37283

Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia

16 p0427 A77-45548

Atmospheric impacts of evaporative cooling systems

[ANL-ES-53]

15 p0367 A77-24643

## EVAPORATORS

Heat exchangers for the Ocean Thermal Energy Power Plant

14 p0176 A77-24219

Internal heat transfer experiments in a simulated CTEC evaporator tube

[APL/JHU/ARO-76-066]

16 p0521 A77-29611

## EXCAVATION

Thermocorer for geothermal applications

16 p0456 A77-48811

## EXHAUST DIFFUSERS

Diffuser augmentation of wind turbines

16 p0490 A77-49093

## EXHAUST GASES

General Motors Sulfate Dispersion Experiment - Assessment of the EPA HIWAY model

13 p0071 A77-18882

Applications of the rapid devolatilization of coal in MHD power cycles

14 p0141 A77-21249

Reduction of atmospheric pollution due to the automobile and energy savings

14 p0162 A77-22948

Water induction in hydrogen-powered IC engines

14 p0171 A77-23721

Raman scattering and the characterisation of atmospheric aerosol particles

15 p0262 A77-31487

Automotive sulfate emissions

15 p0290 A77-34629

Volkswagen develops a diesel

15 p0290 A77-34630

The interaction of automotive-engine efficiency and exhaust pollution

15 p0296 A77-35922

A multigas analyzer for automobile exhausts

15 p0297 A77-36026

An application of the economic-environmental power dispatch --- decision approach for controlling air pollution emission from electric power generation

15 p0317 A77-38121

Optimization of automotive engine fuel economy and emissions

15 p0320 A77-38373

Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79]

15 p0321 A77-38533

Devolatilization of pulverized coal during rapid heating --- in exhaust gases of combustion driven MHD generators

15 p0331 A77-39566

The oxidant formation potential of emissions from catalyst-equipped vehicles

15 p0333 A77-39596

Emission and deposition of petrol engine exhaust Pb. I - Deposition of exhaust Pb to plant and soil surfaces

15 p0333 A77-39655

Hydrogen peroxide emission levels from a hydrogen fueled combustion engine

16 p0399 A77-40644

Energy reduction in cleaning exhausts containing particulates and noxious gases

16 p0414 A77-42740

MHD combustor effluent chemistry measurements using Raman scattering

16 p0425 A77-44825

NOx from fuel nitrogen in two-stage combustion

16 p0439 A77-48169

In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures

16 p0440 A77-48173

Environmental aspects of low Btu gas combustion --- nitrogen oxide emissions from power plants

16 p0440 A77-48178

Exhaust and evaporative emission from a Brazilian Chevrolet fueled with ethanol-gasoline blends

16 p0444 A77-48708

A ceramic heat exchanger for exhaust fired gas turbine power cycles

16 p0445 A77-48719

Eliminate source emission codes for coal-refuse fired power plants

16 p0504 A77-51128

Status of sulfur dioxide removal systems for the electric utility industry

16 p0504 A77-51144

Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator

[WSS/CI PAPER 76-53]

16 p0508 A77-51611

Protocol to characterize gaseous emissions as a function of fuel and additive composition

[PB-253363/6]

13 p0084 A77-10221

Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere

[PB-253375/0]

13 p0092 A77-10715

Reduction of gaseous pollutant emissions from gas turbine combustors using hydrogen-enriched jet fuel

[NASA-CR-149146]

13 p0094 A77-11198

An evaluation of high altitude engine modification devices (econo-kit)

[PB-255556/3]

13 p0101 A77-11589

Investigation and assessment of light-duty-vehicle evaporative emission sources and control

[PB-255813/8]

13 p0102 A77-11603

Emissions and performance of catalysts for gas turbine catalytic combustors

[NASA-TN-X-73543]

13 p0104 A77-12406

The impact of JP-4/JP-8 conversion on aircraft engine exhaust emissions

[AD-A026546]

13 p0112 A77-13234

Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges

[PB-256691/7]

13 p0133 A77-15540

Cooperative study of heavy duty diesel emission measurement methods

[PB-257137/0]

13 p0133 A77-15541

Environmental protection measuring technique. Sensor for automatic continuous emission control of gases

[BMFT-PB-T-76-03]

14 p0209 A77-16467

Methanol engine: A transportation strategy for the post-petroleum era

[UCRL-52041]

14 p0219 A77-19469

Control of waste and water pollution from power plant flue gas cleaning systems

[PB-259211/1]

14 p0227 A77-19953

Hydrogen-enrichment-concept preliminary evaluation

[NASA-CR-152814]

15 p0340 A77-22290

Fuel consumption, emissions, and power characteristics of the 1975 Ford 140-CID automotive engine, experimental data

[PB-261771/0]

15 A77-22725

Size distribution and mass output of particulates from diesel engine exhausts

[PB-261416/2]

15 A77-22732

Emissions and total energy consumption of a multicylinder piston engine running on gasoline and a hydrogen-gasoline mixture

[NASA-TN-D-8487]

15 p0353 A77-23114

Effect of automotive parts on vehicle and engine emissions. Phase 1: Original equipment

[PB-264057/1]

15 p0368 A77-24672

Chemical characterization of diesel exhaust particulates

[PERC/RI-77/5]

16 p0540 A77-31671

- Automobile emission control. The development status, trends, and outlook as of December 1976 [PB-267865/4] 16 p0540 N77-31685
- Automobile emission control: Technological approaches toward improving in-use vehicle emissions performance [PB-267537/9] 16 p0544 N77-32508
- Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment [PB-269270/5] 16 p0561 N77-34058
- EXHAUST NOZZLES**
- Static and wind-on tests of an upper-surface-blown jet-flap nozzle arrangement for use on the Quiet Clean Short-haul Experimental Engine (QCSEE) [NASA-TN-D-8476] 15 p0370 N77-25086
- EXOTHERMIC REACTIONS**
- Differential scanning calorimetry studies on coal. II - Hydrogenation of coals 13 p0070 A77-18583
- Storage of solar energy by inorganic oxide/hydroxides 16 p0492 A77-49109
- EXPERIMENTAL DESIGN**
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [PB-2307-2] 14 p0224 N77-19637
- Developing and testing of a wastewater recycler and heater [NASA-CR-154846] 16 p0531 N77-31040
- EXPLORATION**
- Outer continental shelf oil and gas costs and production volume: Their impact on the nation's energy balance to 1990 [PB-262533/3] 15 p0343 N77-22604
- Recommendations for a US geothermal research plan, volume 1 [PB-261566/4] 15 p0346 N77-22640
- Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets [PB-261567/2] 15 p0346 N77-22641
- Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application [PB-262372/6] 15 p0347 N77-22654
- Use of electrical methods for the delineation of geothermal reservoirs [PB-261507/8] 15 p0351 N77-22750
- Telluric mapping over the Mesa Geothermal Anomaly, Imperial Valley, California [PB-262828/7] 15 p0355 N77-23593
- The Hawaii geothermal project, initial phase 2 progress report [PB-263120/8] 15 p0355 N77-23594
- Research and development assessment on safety and pollution control for outer continental shelf operations [AD-A034727] 15 p0357 N77-23635
- Mathematical modelling of single-phase nonisothermal fluid flow through porous media [PB-262884/0] 15 p0362 N77-24577
- A framework for assessing environmental impacts of possible Antarctic mineral development, part 1 [PB-262750/3] 15 p0368 N77-24709
- Dipole-dipole resistivity surveys, Roosevelt hot springs KGRA, volume 2 [PB-264897/0] 15 p0371 N77-25623
- Geochemistry and hydrothermal alteration at selected Utah hot springs, volume 3 [PB-264415/1] 15 p0378 N77-26606
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2 [PB-264706/3] 15 p0385 N77-26693
- EXPLORER 50 SATELLITE**
- Results from the IMP-J violet solar cell experiment and violet cell balloon flights [NASA-TN-D-8393] 13 p0128 N77-15491
- EXPLOSIONS**
- Explosion compression of plasma up to critical values of thermonuclear microfusion. I, II 16 p0400 A77-41201
- Destator test program evaluation [AD-A034260] 15 p0360 N77-24410
- EXPLOSIVE DEVICES**
- Explosively driven MHD generator power systems for pulse power applications 15 p0299 A77-36300
- EXPLOSIVES**
- Fracturing oil shale for in situ retorting experiments 14 p0193 A77-27341
- EXTERNAL COMBUSTION ENGINES**
- Alternate fuel capability of Rankine cycle engines 13 p0036 A77-12801
- EXTRACTION**
- Comparative economics for the Arthur D. Little extractive coking process 15 p0301 A77-36340
- Fundamentals of coal liquefaction 15 p0309 A77-36814
- EXTRAPOLATION**
- Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation 14 p0149 A77-21794
- EXTRATERRESTRIAL COMMUNICATION**
- On the active and passive CETI from earth satellite orbit --- communication with extraterrestrial intelligence [IAF PAPER A-77-48] 16 p0507 A77-51524
- EXTRATERRESTRIAL MATTER**
- Black magnetic spherule fallout in the eastern Gulf of Mexico 13 p0052 A77-14890
- EXTRATERRESTRIAL RESOURCES**
- Mass driver retrievals of earth-approaching asteroids --- earth orbit capture for mining purposes [AIAA PAPER 77-528] 15 p0265 A77-32053
- Deep space material sources --- from asteroids for space colonies 15 p0295 A77-35805
- Space applications for terrestrial resources 15 p0320 A77-38477
- Mining the Apollo and Amor asteroids 16 p0400 A77-40648
- Extraterrestrial resources and astronautics --- Russian book 16 p0499 A77-49400
- EXTRUDING**
- Re-entrant groove heat pipe --- computerized design for OAO applications [AIAA PAPER 77-773] 15 p0312 A77-37280
- F**
- FABRICATION**
- CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica substrates 13 p0007 A77-11110
- Review of electrode designs and fabrication techniques for lithium-aluminum/iron sulfide cells 13 p0025 A77-12713
- Alternative strategies for implementing silicon-ribbon technology for photovoltaic applications 13 p0039 A77-12819
- Design and fabrication of solar concentrators 13 p0074 A77-19062
- Deposition of polycrystalline silicon solar cells 13 p0076 A77-19082
- Double-faced silicon solar cell system 13 p0076 A77-19090
- Technology of large area Cu<sub>x</sub>/S-CdS solar cells 14 p0149 A77-21798
- Manufacture of plastic foam concentrators and their characteristics 14 p0154 A77-21852
- Heterojunctions in photovoltaic devices 14 p0162 A77-22977
- Advanced high efficiency wraparound contact solar cell [AIAA PAPER 77-521] 14 p0174 A77-23934
- Silicon solar cells by high-speed low-temperature processing 15 p0258 A77-30728
- Vapor-phase fabrication of massive structures in space [AIAA PAPER 77-542] 15 p0270 A77-32597
- Testing and fabrication of solar absorbers for the DSA satellite [CNES-NT-37] 13 p0111 A77-13110

- Research and development of low cost processes for integrated solar arrays  
[COO-2721-76-1] 15 p0383 N77-26670
- Lightweight reflector assembly  
[NASA-CASE-NPO-13707-1] 16 p0518 N77-28933
- Automated fabrication of back surface field silicon solar cells with screen printed wraparound contacts  
[NASA-CR-135202] 16 p0546 N77-32590
- FAIL-SAFE SYSTEMS**
- Emergency power plant of rapid availability for the Berlin-Tegel airport  
13 p0001 A77-10324
- Electric power supply in the case of airports. I  
13 p0061 A77-16742
- The aircraft energy efficiency active controls technology program  
[AIAA 77-1076] 16 p0415 A77-42784
- FAILURE ANALYSIS**
- Laboratory investigation of high temperature alloy failure mechanisms  
15 p0271 A77-32608
- Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base'  
[ASLE PREPRINT 77-AM-2A-1] 15 p0296 A77-35956
- FAILURE MODES**
- Contribution to the solution of planning problems in electric power generation /effects of random disturbances/  
15 p0294 A77-35399
- Preliminary failure modes, effects and Criticality Analysis (FMECA) of the Brayton Isotope Power System (BIPS) ground demonstration system  
[TID-27301] 15 p0392 N77-27526
- FAR INFRARED RADIATION**
- On the theory and solar application of inductive grids --- wave diffraction modeling and far IR measurement  
16 p0419 A77-43556
- FAR ULTRAVIOLET RADIATION**
- Energetics of the midlatitude thermosphere  
13 p0012 A77-11492
- FARM CROPS**
- Field crops as a future source of fuels and chemical feedstocks  
16 p0489 A77-49080
- A fermentation process for converting plant materials into methane  
13 p0121 N77-14583
- Energy and US agriculture. 1974 data base, volume 1. Part A: US series of energy tables. Part B: State series of energy tables  
[PB-264449/0] 15 p0395 N77-27562
- FARMLANDS**
- A feasibility study of bio-gas production in individual farms in Southwestern Ontario  
16 p0489 A77-49082
- A farm energy system employing hydrogen storage  
14 p0239 N77-21600
- FAST NUCLEAR REACTORS**
- Heat pipe nuclear reactor for space power  
13 p0036 A77-12797
- Improvements in energy conversion technology  
16 p0505 A77-51154
- FATIGUE TESTS**
- Metallurgical evaluation of materials for geothermal power plant applications  
16 p0499 A77-49700
- FATS**
- Oil and fat absorbing polymers  
[NASA-CASE-NPO-11609-2] 16 p0532 N77-31308
- FEASIBILITY**
- Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory  
[PB-262980/6] 15 p0356 N77-23619
- Evaluation of the technical and economic feasibility of mirror fusion devices  
[UCRL-13695] 15 p0386 N77-26977
- Solar power satellite. Concept evaluation. Activities report. Volume 2: Detailed report  
[NASA-TM-74942] 16 p0552 N77-33600
- Solar energy: Policy and prospects  
[PB-267986/8] 16 p0554 N77-33620
- FEASIBILITY ANALYSIS**
- A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics  
13 p0021 A77-12673
- An engineering feasibility study of using low temperature geothermal sources in Colorado  
13 p0031 A77-12762
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
13 p0043 A77-12867
- Feasibility of a satellite solar power station /SSPS/  
13 p0047 A77-13504
- Solar power satellites - Opportunity and challenge  
[AIAA PAPER 77-291] 13 p0065 A77-18224
- Space power systems - What environmental impact  
14 p0146 A77-21757
- Is commercial coal conversion practical  
14 p0146 A77-21761
- Some preliminary considerations on photovoltaic conversion of solar energy  
14 p0164 A77-23299
- Solar heating thermal storage feasibility  
[ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483
- A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material  
[ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- Solar power satellite transportation  
14 p0205 A77-30016
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur-families  
15 p0275 A77-33342
- Commodity hydrogen from off-peak electricity  
15 p0283 A77-33403
- Energy storage possibilities of atomic hydrogen  
15 p0283 A77-33405
- Economic feasibility of the conversion of organic waste to fuel oil and pipeline gas  
15 p0302 A77-36346
- Perspectives on implementing OTEC power --- Ocean Thermal Energy Conversion  
[AIAA 77-1024] 16 p0404 A77-41564
- Study of the feasibility of exploiting the galloping phenomenon as energy source  
16 p0407 A77-41722
- On the realisation of projects - With special reference to O'Neill space colonies and the like  
16 p0431 A77-46770
- Powersats - An economic assessment  
16 p0431 A77-46775
- Advanced fuel nuclear reaction feasibility using laser compression. I  
16 p0435 A77-47358
- Advanced fuel nuclear reaction feasibility using laser compression. II  
16 p0435 A77-47359
- Progress of feasibility reassessment of exploiting Fundy tidal energy  
16 p0439 A77-47971
- Space-based solar power study near completion  
16 p0442 A77-48480
- Wind power - Pipe dream or reality  
16 p0442 A77-48503
- The prospects for fuels from biomass  
16 p0445 A77-48713
- Feasibility study of an Integrated Energy/Utility System at the University of Florida  
16 p0449 A77-48751
- Conversion and storage of wind energy as nitrogenous fertilizer  
16 p0450 A77-48762
- Energy extraction characteristics of hot dry rock geothermal systems  
16 p0455 A77-48798
- Recent Canadian activities in solar heating  
16 p0469 A77-48915
- ERDA Solar Thermal Energy Program for industrial process heat  
16 p0470 A77-48922
- Cost effective solar heating of houses with seasonal storage of energy  
16 p0481 A77-49016

- Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018
- Solar energy for process heat 16 p0481 A77-49020
- Technical feasibility of a modular dish solar electric system 16 p0483 A77-49034
- Methane production through biocconversion of agriculture residues 16 p0489 A77-49081
- Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario 16 p0489 A77-49085
- Large windpower systems integrated with existing electric utilities 16 p0490 A77-49094
- The feasibility of solar house heating - A study in applied economics 16 p0493 A77-49117
- A parametric study of critical fuel costs for solar heating in North America 16 p0493 A77-49118
- On the study of applications of solar thermal energy for mobile homes 16 p0501 A77-50204
- Hydrogen production from water utilizing solar heat at high temperatures 16 p0501 A77-50205
- Economics of solar heating with homeowner-type financing 16 p0501 A77-50210
- Solar energy and the residence - Some systems aspects 16 p0502 A77-50213
- Study of the feasibility of federal procurement of fuels produced from solid wastes [PB-255695/9] 13 p0096 N77-11513
- The feasibility of solar energy usage on Red River Army Depot [AD-A025119] 13 p0108 N77-12535
- Interim feasibility assessment method for solar heating and cooling of Army buildings [AD-A026588] 13 p0124 N77-14606
- Analysis of the technical and cost feasibility of solar and/or wind energy systems for Coast Guard public quarters [AD-A028332] 14 p0209 N77-16460
- Technical and economic feasibility analysis of the no-fuel compressed air energy storage concept [BNWL-2065] 14 p0225 N77-19643
- Commodity hydrogen from off-peak electricity 14 p0245 N77-21641
- Procedures for feasibility analysis and preliminary design of total energy systems at military facilities [AD-A033756] 15 p0356 N77-23614
- MHD generator investigations --- feasibility analysis [AD-A032790] 15 p0358 N77-23952
- An analysis of the feasibility of windmills for power generation in New York State [RPI-TA-17] 15 p0380 N77-26638
- Gas-interface studies in large horizontal heat pipes [LA-6646-MS] 16 p0520 N77-29455
- Integrated utility systems: Feasibility study and conceptual design at the University of Florida [PB-266043/9] 16 p0523 N77-29627
- Cost estimation for a theta-pinch reactor [ANL-CTR-TM-40] 16 p0549 N77-32888
- Technical and economic feasibility of solar augmentation for boiler feedwater heating in steam-electric power plants [COO-2864-1] 16 p0555 N77-33626
- Preliminary feasibility evaluation of compressed air storage power systems, volume 1 [CONS/NSF/42-1] 16 p0556 N77-33636
- FEDERAL BUDGETS**
- Daedalophobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada 16 p0494 A77-49121
- Analysis of fiscal year 1977 DOT program by policy and RD and D management objectives. Program levels for fiscal years 1975, 1976, 1977, volume 1 [PB-255401/2] 13 p0117 N77-13922
- Report of the Presidential task force on reform of Federal Energy Administration regulations, volume 2. Table of contents. Appendixes [PB-262182/9] 15 p0347 N77-22650
- Economic and budget impact of the President's energy proposals [GPO-93-689] 16 p0534 N77-31607
- The reporting of federal research and development resources applied to innovation [PB-266765/7] 16 p0541 N77-32009
- NASA authorization, 1978, volume 1, part 2 [GPO-92-082] 16 p0542 N77-32031
- NASA authorization, 1978, volume 1, part 3 [GPO-92-294] 16 p0542 N77-32032
- FEEDBACK CONTROL**
- The intersectoral feedback model [PB-255859/1] 13 p0125 N77-14950
- FERMENTATION**
- Energy from wastes 13 p0006 A77-11038
- A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673
- Clean fuels from biomass 14 p0167 A77-23390
- Synthetic natural gas from animal wastes by anaerobic fermentation 15 p0314 A77-37660
- A fermentation process for converting plant materials into methane 13 p0121 N77-14583
- Bioconversion of agricultural wastes for pollution control and energy conservation [TID-27164] 15 p0383 N77-26675
- FERMI-DIRAC STATISTICS**
- Fermi function model absorption profile for solar-thermal conversion 16 p0483 A77-49035
- FERRROMAGNETIC MATERIALS**
- The long term stability of magnetic liquids for energy conversion devices 14 p0177 A77-24573
- FERROUS METALS**
- Modern incineration - A proven way for recovery of energy and metals 16 p0434 A77-47220
- FERTILIZERS**
- Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer 15 p0290 A77-34895
- Conversion and storage of wind energy as nitrogenous fertilizer 16 p0450 A77-48762
- The K-T process: Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 14 p0237 N77-21567
- Environmental considerations of selected energy conserving manufacturing process options. Volume 15: Fertilizer industry report [PB-264281/7] 15 p0385 N77-26692
- FIBER OPTICS**
- Solar collectors using total internal reflections 14 p0204 A77-29596
- FIBERS**
- Computer program grade 2 for the design and analysis of heat-pipe wicks [NASA-CR-137954] 13 p0118 N77-14375
- Composite fiber flywheel for energy storage [UCRL-78085] 14 p0225 N77-19645
- FIGHTER AIRCRAFT**
- Evaluation of propulsive lift enhancement and variable cycle engines for advanced tactical aircraft [ATAA PAPER 77-885] 15 p0321 A77-38575
- Variable cycle engines for V/STOL fighters 15 p0339 N77-22117
- Variable cycle engine applications and constraints --- for commercial and military (fighter) aircraft 15 p0339 N77-22125
- FILAMENT WINDING**
- Materials and processing approaches to cost competitive wind turbine rotor blades 14 p0157 A77-22144
- Design development of advanced composite flywheels [AD-A030712] 14 p0214 N77-18230

## FILM CONDENSATION

- Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023
- Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators 15 p0316 A77-37767
- Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators 16 p0437 A77-47423

## FILM THICKNESS

- Optimal parameters for solar cell films 14 p0150 A77-21805
- Evaluation of cadmium stannate films for solar heat collectors 14 p0198 A77-29021
- Fundamental studies of black chrome for solar collector use 16 p0498 A77-49160

## FILTRATION

- A laboratory evaluation of precoat filtration parameters for the solvent refined coal process 13 p0059 A77-16474
- Air pollution control for industrial coal-fired boilers 16 p0504 A77-51152
- Aerosol research and development related to health hazards analysis [LA-6539-PR] 15 p0385 A77-26703

## FINANCE

- Electric utility finance workshop [PB-261661/3] 15 p0349 A77-22677

## FINANCIAL MANAGEMENT

- Accounting methods for new-technology non-utility energy installations 15 p0322 A77-38675
- Energy conservation in the investment policies of French firms. I - Formulation of the problem 15 p0324 A77-39504
- Some institutional problems of residential solar heating 16 p0495 A77-49130

- FEA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers [PB-265706/2] 16 p0517 A77-28615
- Improving regulatory effectiveness in Federal/State siting actions. Alternative financing methods [PB-269390/1] 16 p0547 A77-32606

## FINITE DIFFERENCE THEORY

- Calculation of end effects in open-cycle MHD power generators 15 p0329 A77-39558
- A comparison between experimental and numerical investigations of the motion of the water surface in a model surge tank 16 p0505 A77-51257
- A two-dimensional finite difference solution for the transient thermal behavior of tubular solar collector 13 p0083 A77-10105

- Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir [PB-261562/3] 14 p0252 A77-21726

## FINITE ELEMENT METHOD

- Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator [NASA-TM-73718] 16 p0529 A77-30611
- A finite element model for the analysis of waterflood performance [STP71-A75036] 16 p0551 A77-33464

## FIRE PREVENTION

- Risk management of liquefied natural gas installations 13 p0002 A77-10451
- Report of the Army Scientific Advisory Panel Ad Hoc Group on fire-safe fuels [AD-A023763] 13 p0095 A77-11208

## FIREPROOFING

- Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base' [ASLE PREPRINT 77-AA-2A-1] 15 p0296 A77-35956

## FIRES

- Engine performance and fire-safety characteristics of water-containing diesel fuels [AD-A036011] 15 p0377 A77-26330

## FIRING (IGNITING)

- A ceramic heat exchanger for exhaust fired gas turbine power cycles 16 p0445 A77-48719

## FISHES

- JP-4 and JP-9 fuel toxicity studies using water fish and aufwuchs [AD-A027594] 13 p0127 A77-15213

## FISSION PRODUCTS

- The reprocessing of nuclear fuels 13 p0055 A77-15807

## FLAME IONIZATION

- Conductivity of seeded combustion products of acetylene systems 15 p0288 A77-34039

## FLAME PROPAGATION

- Heavy-fuel flame radiation in gas turbine combustors - Exploratory results 16 p0508 A77-51589

## FLAME STABILITY

- Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation 15 p0288 A77-33838

## FLAMES

- Hydrogen combustion. Part 1: Investigation of hydrogen flame control methods [CTI-IV-75-01449] 14 p0235 A77-21204

## FLAMMABLE GASES

- Ignition of flammable gases in crude-oil tankers as a result of metal fracture [AD-A027411] 13 p0127 A77-15121

## FLAPS (CONTROL SURFACES)

- Flap-augmented shrouds for aerogenerators 14 p0183 A77-26085

## FLAT PLATES

- Parametric studies of the thermal trap flat plate collector 13 p0068 A77-18443
- Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials 13 p0068 A77-18444

- Axial conduction in a flat-plate solar collector 13 p0068 A77-18447

- Arrays of fixed flat-plate solar energy collectors - Performance comparisons for differing individual component orientations 13 p0068 A77-18449

- Contribution to the study of solar energy collectors - Selective plates and cells 13 p0072 A77-19051

- Procedure for characterizing flat plate solar collectors 13 p0073 A77-19056

- Thermostatics and thermokinetics of a flat plate solar collector with constant heat capacity 13 p0073 A77-19057

- Thermosole flat plate collectors 13 p0073 A77-19058

- Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation 14 p0149 A77-21794

- Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system 14 p0149 A77-21795

- Heat pipes in flat plate solar collectors [ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517

- Experimental measurements and system implications of the performance of flat plate solar collector configurations [ASME PAPER 76-WA/SOL-14] 14 p0189 A77-26519

- Optimal mass flow rates through flat plate solar collector panels [ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524

- Indoor test methods to determine the effect of vacuum on the performance of a tubular flat plate collector --- for solar energy conversion [ASME PAPER 76-WA/SOL-24] 14 p0190 A77-26529

- Solar collectors - Technology and principles of operation 14 p0197 A77-28676

- Heat transfer problems in flat plate collectors 14 p0202 A77-29570

Improved black nickel coatings for flat plate solar collectors 14 p0204 A77-29585

Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data 15 p0256 A77-30315

Solar-thermal energy systems 15 p0262 A77-31472

Corrosion prevention in aluminum solar systems 15 p0270 A77-32602

Thermal analysis of some flat-plate solar collector designs for improving performance [AIAA PAPER 77-727] 15 p0311 A77-37252

Application of solar energy in Belgium - Study of a flat plate collector --- Flemish book on materials, applications and design parameters 15 p0324 A77-39499

Solar collectors - Technology and principles of operation 15 p0335 A77-39977

The effect of design and operating parameters on the performance of flat plate solar collectors - Calculation method and detailed appraisal 16 p0406 A77-41580

Studies into reduction of radiative heat losses of flat plate solar collectors 16 p0417 A77-42962

Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors 16 p0418 A77-43049

Validity of the isotropic-distribution approximation in solar energy estimations 16 p0422 A77-44477

On the performance of cylindrical parabolic solar concentrators with flat absorbers 16 p0422 A77-44484

Comparison of predicted performance of constant outlet temperature and constant mass flow rate collectors --- for solar energy conversion 16 p0423 A77-44489

Selective absorbers for flat plate collectors 16 p0423 A77-44499

Performance of air-cooled flat plate collectors 16 p0472 A77-48942

Thermal, fluid flow and mechanical performance characteristics of a subatmospheric pressure, distributed flow flat plate collector 16 p0473 A77-48945

Solar process heat from concentrating flat-plate collectors 16 p0474 A77-48957

Extension of the Hottel-Whillier-Bliss model to the analysis of combined photovoltaic/thermal flat plate collectors 16 p0486 A77-49057

The financial incentives for the fabrication of improved absorption coatings for the flat plate collector 16 p0487 A77-49066

Considerations in the development of a high performance per unit cost solar collector 16 p0487 A77-49067

Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161

Performance correlations of five solar collectors tested simultaneously outdoors 16 p0498 A77-49162

Heat transfer analysis of a flat-plate solar energy collector 16 p0501 A77-50207

Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator [NASA-TM-X-73520] 13 p0097 N77-11530

Flat-plate solar collector handbook. A survey of principles, technical data and evaluation results [UCID-17C86] 13 p0105 N77-12506

Standardized performance tests of collectors of solar thermal energy - A flat-plate copper collector with parallel axial striping [NASA-TM-X-73553] 13 p0114 N77-13535

Standardized performance tests of collectors of solar thermal energy: An evacuated flatplate copper collector with a serpentine flow distribution [NASA-TM-X-73415] 13 p0114 N77-13536

Solar energy storage [AD-A028083] 14 p0213 N77-17605

Two investigations of flat-plate solar collector performance 15 p0355 N77-23598

Development of plastic honeycomb flat-plate solar collectors [SAN/1081-76/1] 15 p0372 N77-25640

Recommendations for the performance rating of flat plate terrestrial photovoltaic solar panels 16 p0527 N77-30539

**FLAT SURFACES**

Standard-size facets for the reflecting surface of a solar concentrator 13 p0063 A77-17557

Correlation equation for hourly diffuse radiation on a horizontal surface --- insolation on solar collectors 16 p0422 A77-44481

**FLIGHT CHARACTERISTICS**

A simplified method in flight test techniques for the determination of the range performance of jet aircraft 13 p0060 A77-16600

Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft [SAE PAPER 770470] 15 p0310 A77-37088

**FLIGHT CONDITIONS**

Best-range flight conditions for cruise-climb flight of a jet aircraft 13 p0085 N77-10379

**FLIGHT OPTIMIZATION**

Energy storage in orbital and interplanetary missions [DGLR PAPER 76-189] 13 p0059 A77-16551

**FLIGHT TESTS**

Flight results of a cryogenic cooler designed for Meteosat [IAF PAPER 76-210] 13 p0003 A77-10942

Concorde - Endurance flights results 13 p0016 A77-12114

Hypersonic technology-approach to an expanded program 13 p0051 A77-14597

Layout and flight performance of a hypersonic transport /HST/ [DGLR PAPER 76-198] 13 p0060 A77-16575

A simplified method in flight test techniques for the determination of the range performance of jet aircraft 13 p0060 A77-16600

Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft [SAE PAPER 770470] 15 p0310 A77-37088

Flight test development of a helicopter-towed surface delivery system 15 p0317 A77-38006

**FLOODS**

A finite element model for the analysis of waterflood performance [STP71-A75036] 16 p0551 N77-33464

**FLOW CHARACTERISTICS**

Influence of various losses on the characteristics of high-power MHD generators 13 p0046 A77-13258

Effect of various losses on the characteristics of powerful MHD generators 15 p0263 A77-31538

**FLOW CHARTS**

US energy flow in 1976 [UCID-17443] 16 p0557 N77-33639

**FLOW DISTRIBUTION**

Liquid flow pattern in extraction of geothermal energy 14 p0135 A77-19706

Variable flow turbines 15 p0340 N77-22142

**FLOW MEASUREMENT**

The status of instrumentation and process control techniques for in situ coal gasification 14 p0191 A77-26790

Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers 15 p0330 A77-39564



## FLOW RESISTANCE

- Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide 13 p0058 A77-16213

## FLOW STABILITY

- Influence of flow nonuniformity on plasma instability at the channel wall 15 p0269 A77-32520

## FLOW VELOCITY

- The influence of the Reynolds number on the profiles of velocity and concentration in free jets of different density 13 p0069 A77-18500

- Small scale tests on control methods for some liquefied natural gas hazards [AD-A033522] 15 p0341 A77-22293

## FLUCTUATION THEORY

- Experimental fluctuation analysis in a noble gas MHD generator 15 p0326 A77-39535

## FLUES

- Flue gas desulfurization experience 14 p0136 A77-20381
- Particle size distributions of dusts in the flue gas of power plants and in atmospheric air 15 p0265 A77-31889

- Flue gas desulfurization by fly ash 16 p0504 A77-51146

- Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization [PB-254166/2] 13 p0101 A77-11581

- Technology and economics of flue gas NOx oxidation by ozone [PB-261917/9] 15 p0350 A77-22700

## FLUID DYNAMICS

- Simulation of wind turbine generator system power flow dynamics 14 p0158 A77-22650

- Fluid dynamic energy conversion and transfer processes [AD-A040589] 16 p0533 A77-31444

- Geophysical fluid dynamics background for ocean thermal power plants [DSE/1005-1] 16 p0555 A77-33624

## FLUID FLOW

- Transient behavior of solid sensible heat thermal storage units for solar energy systems 13 p0057 A77-16208

- Monitoring fluid flow by using high-frequency electromagnetic probing [UCRL-51979] 13 p0120 A77-14393

- Geothermal chemistry activities at LASEL [LA-6448-PB] 15 p0344 A77-22623

- Computer simulation of geothermal reservoirs [PB-265104/0] 15 p0395 A77-27564

## FLUID MECHANICS

- Improvements in fluid machines and systems for energy conversion. Volume 4 --- Book 15 p0309 A77-36815

- Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers 15 p0330 A77-39564

## FLUIDIZED BED PROCESSORS

- Hydrogen production by the steam-iron process 13 p0023 A77-12688

- Operation of the Westinghouse Coal Gasification Process Development Unit 13 p0023 A77-12689

- Fluidized bed heat exchangers for geothermal applications 13 p0029 A77-12748

- Heat pipes for fluid-bed gasification of coal - Metallurgical condition of heat pipes after tests in process environment 13 p0031 A77-12764

- Liquid-metal MHD - Cycle studies and generator experiments 13 p0034 A77-12785

- Superalloys for advanced energy systems 13 p0061 A77-16824

- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269

- Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile --- for coal-fired gas turbines 14 p0145 A77-21698

- Gasification of coal in high-velocity fluidized beds 14 p0175 A77-24211

- Fluidized coal combustion - What can be done now 14 p0191 A77-27285

- Fluidized bed combustion 14 p0192 A77-27290

- Applications of fluidized beds in coal technology 15 p0262 A77-31470

- Fluidization and gas combustion in a rotating fluidized bed 15 p0264 A77-31674

- The manufacture of hydrogen from coal 15 p0275 A77-33337

- Synthetic additives for SO2 removal from combustion gas in a fluidized-bed coal combustor 15 p0293 A77-35168

- Economic comparison of synthetic fuels - Gasification and liquefaction 15 p0300 A77-36329

- Economic data for a 50,000 BPD Lurgi/Buhrigas shale oil plant 15 p0300 A77-36331

- The IGT low-Btu gas process - Design and economics --- clean fuel gas from coal 15 p0301 A77-36335

- Winkler technology for clean fuels from coal 15 p0301 A77-36337

- Economics of ethylene production via pyrolysis of coal based Fischer-Tropsch hydrocarbons 15 p0301 A77-36339

- Present status of fluidized-bed combustion 15 p0303 A77-36422

- Fundamentals of coal gasification 15 p0308 A77-36809

- Conventional gasification technologies 15 p0308 A77-36810

- Advanced gasification technologies 15 p0308 A77-36811

- Gasification and generation of electricity --- coal utilization 15 p0308 A77-36812

- Coal gasification power generation 15 p0310 A77-37000

- Coal fired non-equilibrium closed cycle MHD power plant system since ECAS --- Energy Conversion Alternatives Study 15 p0332 A77-39576

- Modelling of entrained-bed pulverized coal gasifiers 16 p0401 A77-41321

- A pressurized fluidized bed coal fired combined cycle electric power generation [AIAA PAPER 77-1013] 16 p0412 A77-42482

- Fluidized-bed incineration of waste materials 16 p0434 A77-47216

- Development of the Westinghouse coal gasification process - A status report 16 p0446 A77-48722

- A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants 16 p0452 A77-48779

- An environmental assessment of liquid metal topping cycles --- in coal-fired fluidized bed processors for electric power generation 16 p0452 A77-48780

- Pressurized fluidized bed pilot plant for production of electric power using high sulfur coal 16 p0453 A77-48782

- Fluidized bed adiabatic combustor power plants - Concepts and comparisons 16 p0453 A77-48784

- The solid-fuel gas turbine for industrial energy production 16 p0453 A77-48785

- A unitized 500-megawatt fluidized bed boiler design 16 p0453 A77-48786

- Analysis of power cycles with centrifugal fluidized bed coal combustion 16 p0453 A77-48787

- Pressurized fluidized-bed coal combustion 16 p0454 A77-48788

- Development of the fluidized-bed carbon-burnup cell 16 p0454 A77-48789

- Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790

- Dynamic modeling of fluidized bed boilers for control system design 16 p0454 A77-48792
- Fluidized-bed combustion of anthracite refuse 16 p0454 A77-48793
- Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations --- for geothermal applications 16 p0455 A77-48799
- A technical scale gas generator for steam gasification of coal using nuclear heat 16 p0502 A77-50255
- Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite 16 p0508 A77-51587
- Computer modeling of coal gasification reactors [FE-1770-4] 13 p0093 N77-10812
- Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power [ERDA-76-69] 13 p0130 N77-15506
- Liquid phase methanol [PB-257615/5] 14 p0212 N77-17594
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 3: Summary and advanced steam plant with pressurized fluidized bed boilers [NASA-CR-134942-VOL-3] 15 p0379 N77-26630
- Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3 [PB-268492/6] 16 p0548 N77-32615
- FLUORESCENCE**
- Solar energy conversion with fluorescent collectors 16 p0499 A77-49166
- FLUORIDES**
- Investigation of metal fluoride thermal energy storage materials 16 p0451 A77-48767
- Safety considerations for high temperature thermal energy storage in fluoride salts 16 p0451 A77-48768
- FLUOROHYDROCARBONS**
- Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750
- New materials for fluorosulfonic acid electrolyte fuel cells [AD-A036988] 15 p0380 N77-26640
- FLUX DENSITY**
- Four different views of the heliostat flux density integral 14 p0158 A77-22645
- FLY BY WIRE CONTROL**
- Power supplies for full time fly-by-wire aircraft control systems 15 p0320 A77-38461
- FLYWHEELS**
- Superflywheel energy storage and nonsynchronous AC/DC/AC electric transmission supplements power system operation 13 p0002 A77-10638
- The fuel efficiency potential of a flywheel hybrid vehicle for urban driving 13 p0020 A77-12664
- High-speed flywheels as possible energy storage devices in the future 13 p0056 A77-15856
- Fiber glass super flywheels 14 p0157 A77-22143
- Flywheel-electric hybrid vehicle 14 p0159 A77-22886
- Development of a high performance and lightweight hybrid flywheel/battery powered electric vehicle drive 14 p0160 A77-22898
- Hybrid propulsion system for motor vehicles with predominantly intermittent mode of operation 14 p0171 A77-23900
- Modeling of electric drive systems for KEW /flywheel/ vehicles 14 p0200 A77-29469
- Optimization of composite flywheel design 15 p0260 A77-31044
- A multi-megajoule inertial-inductive energy storage system 15 p0299 A77-36292
- Composite fiber flywheel for energy storage 15 p0306 A77-36672
- Whirl stability of the pendulously supported flywheel system [ASME PAPER 77-APM-20] 15 p0323 A77-38837
- Flywheel energy storage. I - Basic concepts 15 p0323 A77-39314
- Flywheel energy storage. II - Magnetically suspended superflywheel 15 p0323 A77-39315
- The use of composite flywheels for braking energy recovery in road transport vehicles 16 p0401 A77-41351
- Flywheel hybrid power trains. I - Component and drive selection. II - Numerical optimization and operation 16 p0438 A77-47968
- Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705
- Flywheel module for electric vehicle regenerative braking 16 p0447 A77-48728
- Energy storage - An interference assembled multiring superflywheel 16 p0450 A77-48761
- An assessment of mechanical energy storage for solar systems 16 p0460 A77-48839
- Increased fuel economy in transportation systems by use of energy management: Second year's program. Executive summary [PB-256117/3] 13 p0108 N77-12536
- Design development of advanced composite flywheels [AD-A030712] 14 p0214 N77-18230
- Flywheel-heat engine power for an energy-economic personal vehicle [BNWL-2006] 14 p0214 N77-18448
- Composite fiber flywheel for energy storage [UCRL-78085] 14 p0225 N77-19645
- Economic and technical feasibility study for energy storage flywheels [ERDA-76-65] 14 p0249 N77-21685
- Safety flywheel [NASA-CASE-HQN-10888-1] 15 p0342 N77-22484
- Fiber composite program for flywheel applications [UCRL-50033-76-1] 15 p0345 N77-22633
- Composite flywheel development [Y-2072] 15 p0388 N77-27194
- Applications of a doubly-fed induction machine in a large flywheel energy storage system 16 p0520 N77-29602
- Optimal design of anisotropic (fiber-reinforced) flywheels [UCRL-52169] 16 p0522 N77-29616
- Energy accumulation through stationary flywheel systems [BNFT-FB-T-76-58] 16 p0522 N77-29620
- Demonstration of an inductor motor/alternator/flywheel energy storage system [COO-4010-1] 16 p0535 N77-31620
- Design definition of a mechanical capacitor [NASA-CR-152613] 16 p0552 N77-33603
- FOCUSING**
- Four different views of the heliostat flux density integral 14 p0158 A77-22645
- Method of designing profiles of focusing concentrators and focusing wedges --- for parabolic solar concentrators 14 p0179 A77-25355
- Optical and thermal performance analysis of three line focus collectors [ASME PAPER 76-WA/HT-15] 14 p0186 A77-26475
- Combination of focusing concentrators and focusing lenses 15 p0286 A77-33431
- Method for calculating the profiles of focones and foclines --- for parabolic solar concentrators 16 p0409 A77-41905
- Combination of focones and foclines with radiation receivers 16 p0427 A77-45544
- Solar thermal electric power systems - Comparison of line focus collectors 16 p0483 A77-49032
- FOOD**
- Solar energy for the Australian food processing industry 14 p0181 A77-25900

## FORBIDDEN BANDS

- Increase of diffusion lengths of minority carriers under the effect of a width gradient of the forbidden band  
14 p0151 A77-21823

## FORCED CONVECTION

- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House  
14 p0182 A77-26058

## FORECASTING

- The seat belt light is on --- airline industry economic assessment and forecasts  
13 p0080 A77-19175
- Future scenarios for urban transportation  
[PB-255349/3] 13 p0102 N77-11930
- Bonneville power administration electric energy conservation study  
[PB-256766/7] 13 p0115 N77-13550
- Long-range forecasting properties of state-of-the-art models of demand for electric energy. Volume 2: Annotated bibliography  
[PB-261766/0] 14 p0251 N77-21718
- Role of nuclear power in meeting future U.S. energy needs  
[IAEA-CN-36/396] 16 p0560 N77-33677
- Energy options open to mankind beyond the turn of the century  
[IAEA-CN-36/538] 16 p0560 N77-33679
- World energy supply and demand and the future of nuclear power  
[IAEA-CN-36/583] 16 p0560 N77-33680
- Survey of nuclear fuel cycle economics: 1970 - 1985  
[ORNL-TM-5703] 16 p0561 N77-33968

## FOREIGN TRADE

- Technology transfer from foreign direct investment in the United States. Report of a seminar series  
[PB-263012/7] 15 p0358 N77-24018
- The strategic petroleum reserve and liquefied natural gas supplies  
[PB-265488/7] 16 p0520 N77-29598

## FOREST MANAGEMENT

- Silviculture energy plantations  
16 p0488 A77-49079
- Clean fuels from agricultural and forestry wastes  
[PB-259956/1] 14 p0233 N77-20610

## FORESTS

- Agricultural and forestry wastes as an energy resource  
16 p0489 A77-49083
- Interpretation of Pennsylvania agricultural land use from BRTS-1 data  
[E77-10111] 14 p0215 N77-18525

## FOSSIL FUELS

- Fossil energy research and development in ERDA  
13 p0063 A77-17551
- Relative hazard of nuclear power stations and fossil-fuel power stations to the environment  
13 p0067 A77-18323
- Does solar energy demand more land surface, and more materials or energy investment than nuclear energy or fossil fuels - A preliminary study  
14 p0155 A77-21857
- Economics of alternative energy sources  
15 p0288 A77-33755
- Statistical utility theory for comparison of nuclear versus fossil power plant alternatives  
15 p0291 A77-35015
- The development of net energy estimates for extraction, handling, and processing of selected fuels  
15 p0291 A77-35147
- Economic evaluation by ERDA of alternative fossil energy technologies  
15 p0300 A77-36328
- Economic problems concerning the combustion of raw lignite  
15 p0333 A77-39650
- Options for the conversion of fossil fuels  
15 p0335 A77-39835
- Methodological questions concerning the evaluation of the economic potential of energy resources  
16 p0412 A77-42262
- Evaluation of energy policy  
16 p0415 A77-42859
- Future energy options, ethics and a case for conservation  
16 p0415 A77-42860

Geothermal space heating - The symbiosis with fossil fuel

- 16 p0455 A77-48797
- Assuring the performance of fossil energy programs  
16 p0503 A77-50499
- Combined heat and electricity generation as a means for saving primary energy  
16 p0505 A77-51155
- Critical materials problems in energy production --- Book  
16 p0509 A77-51627
- Minerals in the US economy: Ten-year supply-demand profiles for mineral and fuel commodities  
[PB-252994/9] 13 p0085 N77-10624
- The formation of nitrogen oxides from fuel nitrogen  
[PB-252462/7] 13 p0092 N77-10717
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California  
[PB-254449/2] 13 p0092 N77-10720
- Strategic petroleum reserve  
[PB-255476/4] 13 p0098 N77-11546
- Meeting report: Advanced fossil fuels sector group  
[PB-255117/4] 13 p0099 N77-11549
- Fuel contaminants. Volume 1: Chemistry  
[PB-256020/9] 13 p0103 N77-12231
- Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game  
[PB-255607/4] 13 p0105 N77-12502
- Proceedings of the Stationary Source Combustion Symposium. Volume 2. Fuels and process research and development  
[PB-256321/1] 13 p0116 N77-13570
- IEA energy simulation model: A framework for long-range US energy analysis  
[ORAU-125] 13 p0122 N77-14594
- Precipitation scavenging of fossil-fuel effluents  
[PB-256649/5] 13 p0124 N77-14630
- Existing and proposed fuel conversion facilities. Summary  
[PB-258264/1] 14 p0208 N77-16457
- Fuel gas environmental impact  
[PB-257134/7] 14 p0209 N77-16470
- National plan for energy research, development and demonstration: Creating energy choices for the future. Volume 2: Program implementation --- fossil fuels, solar energy, and geothermal energy  
[ERDA-76-1-VOL-2] 14 p0222 N77-19600
- Fossil energy research program of the Energy Research and Development Administration, FY 1977  
[ERDA-76-63] 14 p0222 N77-19611
- Net energy analysis: An energy balance study of fossil fuel resources  
[PB-259158/4] 14 p0225 N77-19657
- Net energy analysis: An energy balance study of fossil fuel resources. Summary report  
[PB-259159/2] 14 p0225 N77-19658
- Electric power development in the Pacific Northwest Region: Institutional commitments and alternatives, phase 1  
[PB-262382/5] 15 p0348 N77-22671
- Measurement of dry deposition of fossil fuel plant pollutants  
[PB-264495/3] 15 p0376 N77-25685
- Air pollution and the siting of fossil fuel power plants  
[ANL-76-XX-14] 15 p0386 N77-26708
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model  
[PB-264822/8] 16 p0517 N77-28628
- Analysis of energy projections for infrastructure development requirements  
[PB-266419/1] 16 p0524 N77-29640
- Approaches to chemical class analyses of fossil derived materials  
[CONF-770301-5] 16 p0532 N77-31271
- Health effects of pollutants associated with fossil-fuel power generation: An indexed bibliography with abstracts  
[UCD-472-500] 16 p0540 N77-31672
- Summary of cost and quality of electric utility plant fuels, 1976  
[PB-267368/9] 16 p0543 N77-32335

- Experimental program for the development of peat gasification  
[FE-2469-3] 16 p0558 N77-33650
- FOUNDATIONS**
- Energy storage: User needs and technology applications  
[CONF-760212-SUMM] 14 p0222 N77-19604
- Vibration characteristics of a large wind turbine tower on non-rigid foundations  
[NASA-TM-X-73670] 15 p0378 N77-26613
- FRACTIONATION**
- Fractionation and structural characterization of coal liquids 13 p0069 A77-18582
- Approaches to chemical class analyses of fossil derived materials  
[CONF-770301-5] 16 p0532 N77-31271
- FRACTURE MECHANICS**
- Heat extraction from hot dry rock masses  
[PB-256775/8] 13 p0116 N77-13556
- FRACTURE STRENGTH**
- On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs 16 p0454 A77-48796
- Development of a high efficiency thin silicon solar cell  
[NASA-CR-153905] 15 p0391 N77-27502
- FRACTURING**
- Fracturing oil shale for in situ retorting experiments 14 p0193 A77-27341
- Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- Extracting energy from hydraulically-fractured geothermal reservoirs  
[LA-UR-76-848] 14 p0221 N77-19598
- Natural gas massive hydraulic fracture research and advanced technology project  
[SAND-76-0723] 16 p0536 N77-31630
- FRANCE**
- Characteristic aspects of the evolution of the French electric balance in 1975 13 p0012 A77-11340
- A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs 13 p0014 A77-11591
- Energy policies of France, Britain, and Germany compared 15 p0263 A77-31572
- Utilizing alternative energy sources in France 15 p0296 A77-35923
- Perspectives of geothermal energy in France 16 p0399 A77-40512
- Geography of energy production in France. V - The markets of consumption: The Paris region and the Lyon, Strasbourg and Rennes areas 16 p0427 A77-45712
- FREE CONVECTION**
- Thermal convection of water in a porous medium - Effects of temperature- and pressure-dependent thermodynamic and transport properties --- for non-Boussinesq geothermal layers 14 p0145 A77-21546
- Free thermal convection in geothermal fields - Physical understanding and mathematical modeling 14 p0174 A77-24204
- Numerical solutions for steady free convection in island geothermal reservoirs 14 p0174 A77-24205
- Exploring stability criteria of solar ponds  
[ASME PAPER 76-WA/HT-62] 14 p0187 A77-26489
- Analogy between thermal-convective and magnetohydrodynamic instabilities 16 p0425 A77-44690
- FREE JETS**
- The influence of the Reynolds number on the profiles of velocity and concentration in free jets of different density 13 p0069 A77-18500
- FREE RADICALS**
- Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405
- FRENCH SATELLITES**
- Testing and fabrication of solar absorbers for the D5A' satellite  
[CNES-NT-37] 13 p0111 N77-13110
- FREON**
- The thermodynamic cycle of the ONERSOL engine --- solar Rankine piston engine 14 p0152 A77-21829
- Utilization of heat of geothermal springs and waste hot waters in freon-operated power plants 14 p0175 A77-24207
- Investigations of nonsteady-state processes at cryogenic heat pipe operation --- filled with ammonia and Freon-22 13 p0119 N77-14384
- FREQUENCY MULTIPLIERS**
- New modes of operation for avalanche diodes - Frequency multiplication and upconversion 13 p0049 A77-14261
- FREQUENCY RESPONSE**
- Spectral response of a laterally illuminated p-n junction --- as photodetector or photovoltaic energy converter 13 p0062 A77-17478
- FREQUENCY STABILITY**
- Exact 60 cycle power generation at any speed --- for windmill applications 16 p0450 A77-48759
- FRESNEL LENSES**
- The linear Fresnel lens solar concentrator: Transverse tracking error effects  
[NASA-CR-2889] 16 p0521 N77-29606
- Solar concentration by curved-base Fresnel lenses  
[NASA-CR-2890] 16 p0524 N77-29946
- Silicon solar cell testing in concentrated sunlight and simulated sunlight 16 p0527 N77-30540
- An analytical and experimental investigation of a 1.8 by 3.7 meter Fresnel lens solar concentrator  
[NASA-TF-1005] 16 p0529 N77-30617
- FRESNEL REGION**
- An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator 16 p0473 A77-48952
- FUEL CAPSULES**
- Advanced fuels for inertial confinement --- in laser fusion 13 p0061 A77-17016
- An assessment of the materials needs for a Kr-85 fuel capsule 16 p0462 A77-48855
- FUEL CELLS**
- Energy conservation with advanced power generating systems 13 p0026 A77-12723
- Fuel cells --- electrochemical energy conversion 13 p0055 A77-15804
- Electric current from the direct conversion of low molecular weight C,H,O-compounds 13 p0055 A77-15814
- Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte 13 p0055 A77-15815
- Fuel cell assemblies with an acidic electrolyte 13 p0055 A77-15816
- Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides 13 p0056 A77-15817
- Fuel cells - Prospects of their applications for electric utilities 14 p0165 A77-23306
- Fuel cells - A sleeper in the energy race 14 p0170 A77-23647
- Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts --- for fuel cells 14 p0176 A77-24568
- Fuel cells --- Book 14 p0180 A77-25875
- Power Sources Symposium, 27th, Atlantic City, N.J., June 21-24, 1976, Proceedings 14 p0195 A77-28126
- Improved acid electrolytes for the hydrocarbon-air fuel cell 14 p0195 A77-28166
- Hydrocarbon fuel conditioner for a 1.5 kW fuel cell power plant 14 p0195 A77-28168
- Hydrogen cycle peak-shaving on the New York State Grid using fuel cells 14 p0199 A77-29094

## SUBJECT INDEX

## FUEL COMBUSTION

- Anodic oxidation of ethylene glycol with noble metal alloy catalysts --- in fuel cell  
15 p0260 A77-31171
- Influence of bonding and filling agents on the activity of tungsten carbide hydrogen electrodes  
15 p0260 A77-31173
- Improvement in phosphoric acid cell powerplant technology  
[AIAA 77-1011] 16 p0403 A77-41558
- Economic assessment of the utilization of fuel cells in electric utility systems  
[AIAA 77-1012] 16 p0403 A77-41559
- The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface  
16 p0414 A77-42634
- The interaction of batteries and fuel cells with electrical distribution systems - Force commutated converter interface  
16 p0414 A77-42635
- Hybrid simulation of fuel cell power conversion systems  
16 p0414 A77-42636
- On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells  
16 p0425 A77-45151
- Porous electrodes for Zn/air alkaline battery  
16 p0431 A77-46722
- ERDA fuel cell programs  
16 p0447 A77-48734
- Advanced fuel cell technology and applications  
16 p0447 A77-48735
- ERDA Fuel Cell Applied Research Program  
16 p0447 A77-48736
- Molten carbonate fuel cell model  
16 p0447 A77-48737
- 4.8-megawatt fuel cell module demonstrator  
16 p0447 A77-48738
- Post-test analysis of Li/Pes2 compact cells  
16 p0448 A77-48739
- Energy savings through on-site fuel cells in industrial applications  
16 p0449 A77-48752
- Thermal efficiency of solid electrolyte fuel cells with mixed conduction  
16 p0500 A77-50199
- Research on electrochemical energy conversion systems  
[AD-A023689] 13 p0090 N77-10681
- Fuel cell stacks  
[AD-A024216] 13 p0090 N77-10684
- Evaluation of potassium titanate as a component of alkaline fuel cell matrices  
[NASA-TN-D-8341] 13 p0094 N77-11175
- Development of fuel cell CO detection instruments for use in a mine atmosphere  
[PB-254823/8] 13 p0095 N77-11380
- Solid Polymer Electrolyte (SPE) fuel cell technology, program review, phase 2  
[NASA-CR-150957] 13 p0097 N77-11532
- Optimization of PT-doped Kocite (trademark) electrodes in H3 PO4 fuel cells  
[AD-A025326] 13 p0107 N77-12529
- Manufacturing and evaluation of phthalocyanines as catalysts for fuel cells  
[BMFT-PE-T-76-25] 13 p0114 N77-13540
- Hydraulic ram effect on composite fuel cell entry walls  
[AD-A024632] 13 p0115 N77-13548
- Carbon oxidation catalyst mechanism study for fuel cells  
[PB-256420/1] 13 p0115 N77-13551
- A study of the failure of joints in composite material fuel cells due to hydraulic ram loading  
[AD-A027258] 13 p0117 N77-14016
- National benefits associated with commercial application of fuel cell powerplants  
[ERDA-76-54] 13 p0123 N77-14597
- Aluminum-based anodes for underwater fuel cells: A phase report  
[AD-A026405] 13 p0131 N77-15512
- Surface research for development of new electrocatalysts for acid electrolyte fuel cells  
[AD-A026053] 13 p0131 N77-15517
- An improved electrolyte for direct oxidation fuel cells  
[AD-A026164] 13 p0131 N77-15518
- Investigation of acid-resistant electrocatalysts for fuel cells  
[NASA-TT-F-17367] 14 p0207 N77-16444
- Fuel cell stacks  
[AD-A030375] 14 p0213 N77-17603
- Fuel cell benefit analysis  
[ANL-ZS-51] 14 p0232 N77-20593
- Hydrogen storage, water electrolysis and fuel cells for electric energy storage  
[BNL-21498] 15 p0344 N77-22620
- The 10th International Power Sources Symposium  
[AD-A033323] 15 p0347 N77-22656
- Experimental evaluation of a breadboard heat and product-water removal system for a space-power fuel cell designed with static water removal and evaporative cooling  
[NASA-TN-D-8485] 15 p0363 N77-24592
- Optimization of PT-doped Kocite (R) trademark electrodes in H3 PO4 fuel cells  
[AD-A034604] 15 p0365 N77-24618
- Fuel cells and solid electrolytes  
[AD-A033782] 15 p0366 N77-24630
- Research on electrochemical energy conversion systems  
[AD-A034454] 15 p0367 N77-24632
- Methanol-air batteries  
[AD-A035942] 15 p0375 N77-25675
- New materials for fluorosulfonic acid electrolyte fuel cells  
[AD-A036988] 15 p0380 N77-26640
- Fuel cell stacks  
[AD-A037586] 15 p0380 N77-26641
- Advanced technology fuel cell program  
[EPRI-EM-335] 15 p0391 N77-27508
- Economic assessment of the utilization of fuel cells in electric utility  
[EPRI-EM-336] 15 p0392 N77-27516
- Basic research on ceramic materials for energy storage and conversion systems  
[COO-2564-2] 16 p0511 N77-28305
- Optimization of platinum-doped Kocite electrodes in H3PO4 fuel cells  
[AD-A039242] 16 p0529 N77-30626
- Solid polymer electrolyte (SPE) fuel cell technology program, phase 1/1A --- design and fabrication  
[NASA-CR-151506] 16 p0553 N77-33605
- Solid polymer electrolyte (SPE) fuel cell technology program, phase 2/2A --- testing and evaluations  
[NASA-CR-151507] 16 p0553 N77-33606
- Application of the Alstom/Exxon alkaline fuel cell system to utility power generation  
[EPRI-EM-384] 16 p0557 N77-33643

## FUEL COMBUSTION

- Sulphur pollution and emission charges  
13 p0005 A77-11033
- Influence of heavy fuel oil composition and boiler combustion conditions on particulate emissions  
13 p0008 A77-11162
- Slag interaction phenomena on MHD generator electrodes  
[AIAA PAPER 77-109] 14 p0135 A77-19833
- The minimum combustion gas recirculation ratio for fuel gas conversion in a MHD cycle  
14 p0157 A77-22552
- Utilization of disposed petroleum products and industrial wastes as fuels  
14 p0167 A77-23404
- Coal-in-oil - A substitute boiler fuel  
[ASME PAPER 76-WA/FU-2] 14 p0185 A77-26453
- Combustion of pulverized, solvent-refined coal  
[ASME PAPER 76-WA/FU-6] 14 p0185 A77-26456
- Methanol - A clean burning fuel for automobile engines  
14 p0405 A77-29930
- Fluidisation and gas combustion in a rotating fluidised bed  
15 p0264 A77-31674
- Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products  
15 p0269 A77-32506
- Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply  
15 p0272 A77-33170
- Jet fuel quality considerations  
15 p0272 A77-33273

## FUEL CONSUMPTION

## SUBJECT INDEX

- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 15 p0283 A77-33407
- Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation 15 p0288 A77-33838
- Economic problems concerning the combustion of raw lignite 15 p0333 A77-39650
- Hydrogen peroxide emission levels from a hydrogen fueled combustion engine 16 p0399 A77-40644
- Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation 16 p0439 A77-48092
- Synthetic fuels and combustion 16 p0439 A77-48159
- NOx from fuel nitrogen in two-stage combustion 16 p0439 A77-48169
- Environmental aspects of low Btu gas combustion --- nitrogen oxide emissions from power plants 16 p0440 A77-48178
- Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723
- Pressurized fluidized-bed coal combustion 16 p0454 A77-48788
- Development of the fluidized-bed carbon-burnup cell 16 p0454 A77-48789
- Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- Ignition of droplets of liquid fuels solvent extracted from coal 16 p0508 A77-51588
- The formation of nitrogen oxides from fuel nitrogen [PB-252462/7] 13 p0092 N77-10717
- Proceedings of the Stationary Source Combustion Symposium. Volume 1. Fundamental research [PB-256320/3] 13 p0116 N77-13569
- Proceedings of the Stationary Source Combustion Symposium. Volume 2. Fuels and process research and development [PB-256321/1] 13 p0116 N77-13570
- Survey of emissions control and combustion equipment data in industrial process heating [PB-263453/3] 15 p0368 N77-24674
- Durability testing at one atmosphere of advanced catalysts and catalyst supports for automotive gas turbine engine combustors, part 1 [NASA-CR-135132] 16 p0520 N77-29519
- Health effects of pollutants associated with fossil-fuel power generation: An indexed bibliography with abstracts [UCD-472-500] 16 p0540 N77-31672
- Estimation of net enthalpies of combustion of some aviation fuels expressed in the international system of units (SI) [NBS-TN-937] 16 p0550 N77-33370
- FUEL CONSUMPTION**
- The fuel approach to control emissions from aircraft [IAF PAPER 76-111] 13 p0003 A77-10911
- Equation solution accuracy in calculating jet engine characteristics 13 p0020 A77-12502
- Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system 13 p0020 A77-12665
- Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708
- Air transportation and fuel consumption 13 p0051 A77-14563
- Scientific-technological problems of the development of a fuel-energy complex in the USSR 13 p0051 A77-14703
- Fuel consumption of civil jet transport aircraft 13 p0062 A77-17234
- Contribution of the heat carried by solar radiation to the thermal balance of a room during the cold season and its effect on domestic fuel consumption 13 p0063 A77-17558
- Theoretical aspects of optimization of aviation gas turbine engine design variables 13 p0063 A77-17762
- Analysis of parameters and characteristics of a bypass turbojet engine operating in a cycle with stepwise heat removal 13 p0063 A77-17765
- Regulatory reform of air transportation [AIAA PAPER 77-276] 13 p0065 A77-18215
- Problems of analysis of the power characteristic of a high capacity magnetohydrodynamic power station 14 p0143 A77-21270
- Small gas turbines and the Total Energy concept 14 p0156 A77-22024
- Hybrid propulsion system for motor vehicles with predominantly intermittent mode of operation 14 p0171 A77-23900
- The potential for fuel conservation 14 p0178 A77-24960
- Fiat petrol engine performance with a mixture of basil extract with petrol 14 p0179 A77-25196
- Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors [ASME PAPER 76-WA/FU-10] 14 p0185 A77-26457
- Design considerations for heat recovery system for DD-963 class ship [ASME PAPER 77-GT-106] 14 p0197 A77-28616
- Energy and economic trade offs for advanced technology subsonic aircraft 14 p0201 A77-29471
- Effects of selected R&D options on fuel usage in the commercial air system 14 p0201 A77-29472
- Ways of improving fuel utilization in industry 15 p0265 A77-31935
- Automotive fuel-saving system with on-board hydrogen generation and injection into I. C. engines 15 p0280 A77-33384
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392
- Dynamic tests of hydrogen-powered IC engines 15 p0282 A77-33395
- Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396
- The outlook for more efficient fuel utilization in generation of process heat 15 p0294 A77-35400
- The interaction of automotive-engine efficiency and exhaust pollution 15 p0296 A77-35922
- Historical patterns of residential and commercial energy uses 15 p0298 A77-36244
- Energy and aerospace /Sixty-fifth Wilbur and Orville Wright Memorial Lecture/ --- aerospace contributions to energy conservation 15 p0304 A77-36434
- Residential energy use alternatives to the year 2000 15 p0307 A77-36768
- Energy utilization factor in civil transport aircraft 15 p0307 A77-36788
- The auto option --- bus usage in urban areas 15 p0310 A77-36983
- Optimization of automotive engine fuel economy and emissions 15 p0320 A77-38373
- The impact of the energy crisis on the demand for fuel efficiency - The case of general aviation 16 p0410 A77-42038
- Thermal storage - It saves and saves and saves --- energy conservation 16 p0415 A77-42741
- The aircraft energy efficiency active controls technology program [AIAA 77-1076] 16 p0415 A77-42784
- Energy aspects of VTOL aircraft in comparison with other air and ground vehicles 16 p0419 A77-43333
- National Airlines Fuel Management and Allocation Model 16 p0419 A77-43399

## SUBJECT INDEX

## FUEL CONSUMPTION CONTD

- Electric vehicles - A major potential contribution to solution of U.S. energy problems  
16 p0420 A77-44060
- Air New Zealand's methods of flying the DC-10  
[AIAA PAPER 77-1255] 16 p0421 A77-44343
- Effects of exhaust manifold configuration on a turbocharged engine emitting charge stratification  
[SAE PAPER 770047] 16 p0424 A77-44557
- Fuel conservation through airplane maintenance  
16 p0427 A77-45925
- Comparing alternative methods of improving fuel economy --- in automobiles  
16 p0443 A77-48702
- Improving automobile fuel economy with advanced transmissions  
16 p0444 A77-48704
- Continuously-variable transmission concepts suitable for flywheel hybrid automobiles  
16 p0444 A77-48705
- National Emissions Data Systems (NEDS) fuel use report, 1973  
[PB-253908/8] 13 p0083 N77-10220
- A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results  
[PB-252485/8] 13 p0088 N77-10662
- Gasoline and distillate shortage situation: 1972-1976  
[PB-253322/2] 13 p0089 N77-10670
- Baseline energy forecasts and analysis of alternative strategies for airline fuel conservation  
[PB-255351/9] 13 p0091 N77-10690
- Optimizing the use of materials and energy in transportation construction  
[PB-253713/2] 13 p0096 N77-11475
- Societal implications of energy scarcity. Social and technological priorities in steady state and constructing systems  
[PB-253097/0] 13 p0099 N77-11556
- Energy use in the contract construction industry  
[PB-245422/1] 13 p0099 N77-11557
- Energy use in the contract construction industry. Appendix A: Study methodology  
[PB-245423/9] 13 p0099 N77-11558
- Energy use in the contract construction industry. Appendix B: Assessment of construction equipment availability, energy requirements, and construction industry capacity to support Project Independence  
[PB-245424/7] 13 p0100 N77-11559
- An evaluation of high altitude engine modification devices (econc-kit)  
[PB-255556/3] 13 p0101 N77-11589
- California energy outlook  
[UCRL-5196-REV-1] 13 p0106 N77-12525
- Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary  
[PB-255994/6] 13 p0107 N77-12533
- Impacts of synthetic liquid fuel development. Automotive market. Volume 2  
[PB-255995/3] 13 p0108 N77-12534
- Increased fuel economy in transportation systems by use of energy management: Second year's program. Executive summary  
[PB-256117/3] 13 p0108 N77-12536
- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts east of the Mississippi  
[PB-255176/0] 13 p0112 N77-13229
- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts west of the Mississippi  
[PB-255177/8] 13 p0112 N77-13230
- Hybrid drive with kinetic energy store as vehicle drive  
[UCRL-TRANS-11018] 13 p0120 N77-14486
- Research plan for achieving reduced automotive energy consumption  
[PB-255929/2] 13 p0121 N77-14495
- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137926] 13 p0126 N77-15007
- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137927] 13 p0126 N77-15008
- Study of unconventional aircraft engines designed for low energy consumption  
[NASA-CR-135136] 13 p0127 N77-15043
- Alternative fuels for aviation  
[GPO-78-544] 13 p0127 N77-15212
- Increased fuel economy in transportation systems by use of energy management - second year's program  
[PB-257177/6] 13 p0133 N77-15930
- Aircraft fuel efficiency program  
[S-REPT-94-633] 14 p0209 N77-17032
- Production and consumption of coal, 1976 - 1980  
[PB-257441/6] 14 p0212 N77-17593
- Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations  
[AD-A031163] 14 p0226 N77-19662
- Feasibility of meeting the energy needs of Army bases with self-generated fuels derived from solar energy plantations. Appendixes A, B, and C  
[AD-A031164] 14 p0226 N77-19663
- Projected natural gas curtailments and potential needs for additional alternate fuels, 1976-1977 heating season  
[PB-260535/0] 14 p0235 N77-21257
- Mirror hybrid reactor optimization studies  
[UCRL-78614] 14 p0253 N77-21939
- High efficiency engine cycles for air transport fuel economy  
15 p0339 N77-22126
- Hydrogen-enrichment-concept preliminary evaluation  
[NASA-CR-152814] 15 p0340 N77-22290
- Historical trends in coal utilization and supply  
[PB-261278/6] 15 p0341 N77-22295
- Impact of alternate fuels on industrial refractories and refractory insulation applications: An assessment  
[ORNL-TM-5592] 15 p0344 N77-22618
- Fuel consumption, emissions, and power characteristics of the 1975 Ford 140-CID automotive engine, experimental data  
[PB-261771/0] 15 N77-22725
- Examination of the costs, benefits and energy conservation aspects of the NASA aircraft fuel conservation technology program  
[NASA-CR-152683] 15 p0352 N77-23007
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis  
[NASA-CR-137923] 15 p0353 N77-23072
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses  
[NASA-CR-137924] 15 p0353 N77-23073
- Emissions and total energy consumption of a multicylinder piston engine running on gasoline and a hydrogen-gasoline mixture  
[NASA-TN-D-8487] 15 p0353 N77-23114
- The 1975 automotive characteristics data base  
[PB-262015/1] 15 p0354 N77-23507
- State projections of industrial fuel needs  
[PB-263338/6] 15 p0356 N77-23620
- The potential for transit as an energy saving option  
[PB-263087/9] 15 p0359 N77-24019
- Truck fleet experience with fuel economy improvement measures  
[PB-263022/6] 15 p0361 N77-24514
- Future natural gas supply to the Northeast  
[BNL-50558] 15 p0364 N77-24595
- Fuel efficiency improvement in rail freight transportation: Multiple unit throttle control to conserve fuel  
[PB-262470/8] 15 p0366 N77-24629
- Fuels and energy data: United States by states and census divisions, 1973  
[PB-262362/7] 15 p0367 N77-24636
- Vapor recovery analysis  
[PB-262846/9] 15 p0368 N77-24667
- Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work. Analysis of the Philadelphia-Lindenwood high-speed line  
[PB-263048/1] 15 p0370 N77-25014
- Transportation programming, economic analysis, and evaluation of energy constraints  
[PB-262878/2] 15 p0370 N77-25018
- Electric utility coal consumption and generation trends, 1976-1985  
[PB-262483/1] 15 p0374 N77-25667

- Techniques for the analysis of total energy and labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- Mid-term and long term energy trends  
[PB-264740/2] 15 p0395 N77-27559
- Feasibility test on compounding the internal combustion engine for automotive vehicles, task 2  
[COC-2690-1] 16 p0512 N77-28495
- Analysis of regenerated single-shaft ceramic gas-turbine engines and resulting fuel economy in a compact car  
[NASA-TM-X-3531] 16 p0521 N77-29607
- Energy fact book, 1977 --- energy sources, technology, and conservation  
[AD-A038802] 16 p0522 N77-29624
- An overview of concepts for aircraft drag reductions  
16 p0543 N77-32092
- The President's energy program  
[GPO-88-556] 16 p0552 N77-33599
- Energy statistics: A supplement to the summary of national transportation statistics  
[PB-269301/8] 16 p0559 N77-33672
- FUEL CONTAMINATION**
- Fuel contaminants. Volume 1: Chemistry  
[PB-256020/9] 13 p0103 N77-12231
- Fuels and lubricants --- an evaluation of military fuels and lubricants  
[AD-A032842] 15 p0359 N77-24314
- Determination of hydrogen sulfide in refinery fuel gases  
[PB-268240/9] 16 p0543 N77-32277
- FUEL CONTROL**
- Application of simulation studies to the design and improvement of fuel control systems for aviation turbine engines  
13 p0054 A77-15798
- Automotive gas turbine fuel control  
[NASA-CASE-LEW-12785-1] 13 p0113 N77-13426
- Impact of fuel properties on jet fuel availability  
[AD-A029493] 14 p0219 N77-19278
- FUEL FLOW**
- Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock  
14 p0200 A77-29437
- A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- FUEL FLOW REGULATORS**
- Oil cooling system for a gas turbine engine  
[NASA-CASE-LEW-12830-1] 15 p0353 N77-23106
- FUEL INJECTION**
- The performance of hydrogen-injected reciprocating engines  
13 p0033 A77-12780
- New developments on VW-PCI and VW-PCV stratified charge engine concepts --- Pre-Chamber-Injection and Pre-Chamber-Valve combustion processes  
16 p0401 A77-41257
- Additional heating and refuelling for the ASDEX divertor Tckamak  
16 p0407 A77-41710
- Bosch technical instruction. Gasoline injection D and L-jetronic  
[NASA-TT-F-17111] 13 p0095 N77-11399
- FUEL OILS**
- Influence of heavy fuel oil composition and boiler combustion conditions on particulate emissions  
13 p0008 A77-11162
- COSTEAM: Low-rank coal liquefaction - An updated analysis  
13 p0045 A77-12934
- Production of atmospheric nitrous oxide by combustion  
13 p0061 A77-16922
- Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels  
14 p0177 A77-24852
- Upgrading coal liquids to gas turbine fuels. III - Exploratory process studies  
14 p0178 A77-24853
- Environmental considerations of converting fossil-fueled power plants from oil or natural gas to coal  
14 p0181 A77-26043
- Hydrotreating of oil shale with nuclear process heat  
[ASME PAPER 76-WA/ENER-3] 14 p0185 A77-26432
- Coal-in-oil - A substitute boiler fuel  
[ASME PAPER 76-WA/FU-2] 14 p0185 A77-26453
- Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors  
[ASME PAPER 76-WA/FU-10] 14 p0185 A77-26457
- Economics of synthetic gas production by the SEGAS process  
15 p0302 A77-36341
- Economic feasibility of the conversion of organic waste to fuel oil and pipeline gas  
15 p0302 A77-36346
- Fuel conversion strategy impacts on compliance with photochemical oxidant standards  
15 p0333 A77-39585
- Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation  
16 p0439 A77-48092
- Heavy-fuel flame radiation in gas turbine combustors - Exploratory results  
16 p0508 A77-51589
- Crude oil supply alternatives for the Northern Tier states  
[PB-255991/2] 13 p0107 N77-12530
- Performance of emission control devices on boilers firing municipal solid waste and oil  
[PB-257136/2] 13 p0133 N77-15550
- Fuel gas environmental impact  
[PB-257134/7] 14 p0209 N77-16470
- Waste POL disposal through energy recovery  
[AD-A031783] 14 p0235 N77-20957
- Petroleum market shares: A report on sales of distillate and residual fuel oil to ultimate consumers, 1975  
[PB-260565/7] 15 p0341 N77-22292
- Heating oils, 1976  
[BERC/PPS-76/4] 15 p0344 N77-22626
- Oil cooling system for a gas turbine engine  
[NASA-CASE-LEW-12830-1] 15 p0353 N77-23106
- Petroleum situation reports 1974-1975  
[PB-265848/2] 16 p0513 N77-28573
- Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3  
[PB-268492/6] 16 p0548 N77-32615
- FUEL PUMPS**
- The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements  
13 p0028 A77-12735
- FUEL SPRAYS**
- Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio  
15 p0293 A77-35186
- FUEL SYSTEMS**
- Alternate fuel capability of Rankine cycle engines  
13 p0036 A77-12801
- Liquefied natural gas for California  
14 p0183 A77-26083
- Fuel subsystem characteristics for LH2 aircraft  
15 p0281 A77-33393
- Development of a liquid hydrogen car  
15 p0282 A77-33394
- Prototype hydrogen automobile using a metal hydride  
15 p0282 A77-33398
- Hydrogen safety problems --- fuel systems hazard prevention  
15 p0283 A77-33402
- Cryogenic fuel systems for motor vehicles  
16 p0411 A77-42166
- Protocol to characterize gaseous emissions as a function of fuel and additive composition  
[PB-253363/6] 13 p0084 N77-10221
- First World Hydrogen Energy Conference proceedings, volume 3  
14 p0243 N77-21626
- FUEL TANKS**
- Liquid hydrogen as propellant for commercial aircraft  
[DGLR PAPER 76-188] 13 p0059 A77-16534
- The technical concept of the IL-62M. II - Fuel system  
14 p0156 A77-22120
- The importation of liquefied natural gas  
14 p0194 A77-27607



## SUBJECT INDEX

## FUSION REACTORS

Ignition of flammable gases in crude-oil tankers  
as a result of metal fracture  
[AD-A027411] 13 p0127 N77-15121

Automotive hydride tank design 14 p0244 N77-21637

**FUEL TESTS**

Recent tests of industrial gas turbine combustors  
fueled with simulated low heating value coal gas  
[ASME PAPER 76-WA/GT-3] 14 p0185 A77-26459

Experimental results using methanol and  
methanol/gasoline blends as automotive engine fuel  
[BERC/R1-76/15] 15 p0389 N77-27245

**FUEL-AIR RATIO**

Studies on realization of normal combustion of  
hydrogen in spark-ignition engines by reduction  
of temperature of residual burnt gases  
14 p0195 A77-28050

Soot and gaseous pollutant formation in a burning  
fuel spray in relation to pressure and air/fuel  
ratio 15 p0293 A77-35186

Burner design criteria for control of NOx from  
natural gas combustion. Volume 1: Data  
analysis and summary of conclusions  
[PB-254167/0] 13 p0091 N77-10686

**FUELS**

Fuels from biomass - Energy outlay versus energy  
returns: A critical appraisal 15 p0322 A77-38673

Study of the feasibility of federal procurement of  
fuels produced from solid wastes  
[PB-255695/9] 13 p0096 N77-11513

Systems study of fuels from sugar cane, sweet  
sorghum, and sugar beets  
[TID-27032] 14 p0211 N77-17570

An evaluation of methanol, ethanol, the propanols,  
and the butanols as ship propulsion fuels  
[AD-A033483] 15 p0354 N77-23277

Systems study of fuels from sugarcane, sweet  
sorghum, sugar beets, and corn  
[TID-27336] 15 p0377 N77-26324

Operation of military field heating equipment  
using solid fuels  
[AD-A037121] 15 p0388 N77-27152

Parametric study of critical fuel costs for solar  
heating in North America  
[CONF-76C842-12] 15 p0392 N77-27533

Energy and US agriculture. 1974 data base, volume  
1. Part A: US series of energy tables. Part  
B: State series of energy tables  
[PB-264449/0] 15 p0395 N77-27562

Hydrocarbon fuels from solar energy via the alga  
Botryococcus brauni  
[ARL/MECB-ENG-148] 16 p0513 N77-28576

System study of fuels from grains and grasses  
[DSE/3729-1] 16 p0519 N77-29318

Energy fact book, 1977 --- energy sources,  
technology, and conservation  
[AD-A038802] 16 p0522 N77-29624

An economic evaluation of a process to separate  
raw urban refuse into its metal, mineral, and  
energy components  
[PB-267629/4] 16 p0531 N77-31046

Alternate petroleum based fuels for naval fleet  
usage: potential availability, cost, and system  
impact  
[AD-A041980] 16 p0551 N77-33372

DoD energy R and D. Part 2: Military fuel  
operations. Performance and R and D implications  
[AD-A042272] 16 p0554 N77-33617

**FULL SCALE TESTS**

Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361

General Electric prepares the LM5000 for testing  
16 p0505 A77-51169

**FUNCTIONAL ANALYSIS**

Focused solar collector analysis with axially  
varying input due to shadowing from adjacent  
collectors  
[SAND-76-5061] 15 p0345 N77-22635

**FURNACES**

Laboratory investigation of high temperature alloy  
failure mechanisms 15 p0271 A77-32608

**FUSION (HEATING)**

An immiscible fluid - Heat of fusion energy  
storage system 16 p0493 A77-49113

## FUSION REACTORS

Fusion power --- nuclear energy technology  
development 13 p0005 A77-11034

Muon catalysed fusion for pellet ignition  
13 p0012 A77-11468

Current status of the magnetic fusion program  
13 p0035 A77-12792

PACER - A practical fusion power concept  
13 p0035 A77-12793

The migma high energy advanced fuel direct  
conversion fusion power plant 13 p0035 A77-12794

Concept of a fusion burner 13 p0061 A77-17014

World survey of major facilities in controlled  
fusion research --- Book 13 p0067 A77-18264

Heat transfer problems associated with laser fusion  
13 p0068 A77-18441

Superconducting induction coil for a doublet  
Tokamak experimental fusion power reactor  
14 p0144 A77-21376

Overview of energy research and development  
administration inertial confinement fusion program  
14 p0146 A77-21744

Status and outlook of controlled nuclear fusion  
14 p0163 A77-23095

Possibility of medium energy neutral beam  
injection into stellarator reactor  
14 p0184 A77-26093

Review of the conceptual design of a doublet  
fusion experimental power reactor  
[ASME PAPER 76-WA/NE-9] 14 p0188 A77-26494

Design considerations for a migma advanced fuel  
fusion reactor 15 p0334 A77-39747

Update on the development of 120-keV  
multi-megawatt neutral beam source 15 p0335 A77-39749

Applications of superconducting magnets to energy  
with particular emphasis on fusion power  
16 p0411 A77-42161

Symposium on Engineering Problems of Fusion  
Research, 6th, San Diego, Calif., November  
18-21, 1975, Proceedings 16 p0425 A77-44975

Review of toroidal theta-pinch theory 16 p0427 A77-45628

Symposium on Clean Fusion, 1st, Washington, D.C.,  
April 30, 1976, Proceedings 16 p0435 A77-47355

Clean fusion concepts and efforts - A survey  
16 p0435 A77-47356

The 1976 status of the Migma program of controlled  
fusion 16 p0435 A77-47360

Advanced fuel fusion experimentation with  
Migmacells II and III - Orbit diagnostics and  
lifetime measurements 16 p0436 A77-47362

Methods of 'tailoring' ion distributions in phase  
space /'morphodynamics'/ --- in Migma-type  
fusion reactors 16 p0436 A77-47364

Conditions for a boron fusion reactor in the MeV  
range 16 p0436 A77-47366

Generalized criterion for controlled fusion  
16 p0436 A77-47368

Unified criterion for proximity to controlled fusion  
16 p0436 A77-47369

Electron beam heated solenoid reactors for fusion  
power and fissile fuel breedings 16 p0459 A77-48827

Fusion energy option  
[BNWL-SA-5802] 14 p0213 N77-17891

Technical and economic feasibility of US district  
heating systems using waste heat from fusion  
reactors 14 p0232 N77-20606

Fusion. The future energy source  
[AROI-10] 15 p0397 N77-27951

Cost estimation for a theta-pinch reactor  
[ANL-CTR-TN-40] 16 p0549 N77-32888

Environmental cost/benefit analysis for fusion  
power plants 16 p0549 N77-32893

[BNWL-2028]

## FUSION-FISSION HYBRID REACTORS

- Comparative breeding characteristics of fusion and fast reactors 15 p0257 A77-36124
- Mirror hybrid reactor optimization studies [UCRL-78614] 14 p0253 N77-21939
- Optimization of fusion-driven fissioning systems [PPPL-1245] 15 p0342 N77-22469

## G

## GALLIUM ARSENIDES

- Investigation of p-Al<sub>x</sub>Ga<sub>1-x</sub>As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra 14 p0143 A77-21311
- Gallium arsenide concentrator system [AIAA PAPER 77-487] 14 p0172 A77-23907
- A solar power system with gallium arsenide solar cells [AIAA PAPER 77-519] 14 p0174 A77-23932
- Design considerations for high-intensity solar cells 14 p0179 A77-25591
- GaAs solar cells for very high concentrations 14 p0204 A77-29581
- An isothermal etchback-regrowth method for high-efficiency Ga<sub>1-x</sub>Al<sub>x</sub>As-GaAs solar cells 15 p0257 A77-30372
- Efficiency calculations for Al<sub>x</sub>Ga<sub>1-x</sub>As-GaAs heterojunction solar cells 15 p0257 A77-30720
- Large-area high-efficiency AlGaAs-GaAs solar cells 15 p0259 A77-30738
- Technology of GaAs metal-oxide-semiconductor solar cells 15 p0259 A77-30739
- A comparison of GaAs and Si hybrid solar power systems 16 p0406 A77-41584
- High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741
- GaAs double-heterostructure photodetectors --- solar cell design 16 p0426 A77-45304
- Design and analysis of a 5000-MW GaAlAs satellite power system 16 p0464 A77-48871
- N-CdS/n-GaAs voltage-enhanced photoanode --- in photoelectrochemical solar cell 16 p0503 A77-50287
- Experimental study of the theoretical and technological possibilities to manufacture solar cells using GaAlAs-layers on GaAs-structures [BMFT-FE-W-76-10] 14 p0212 N77-17584
- High-efficiency thin-film GaAs solar cells [PB-258493/6] 14 p0212 N77-17599
- Analysis of GaAs and Si solar energy hybrid systems [NASA-CR-2800] 14 p0229 N77-20564
- Development of an (AlGaAs-Ca As) graded band gap solar cell [NASA-CR-145161] 15 p0355 N77-23603
- Investigation of GaAs solar cell potential performance and cost [AD-A040736] 16 p0553 N77-33612
- GALLIUM SELENIDES**
- Photovoltaic properties of GaSe and InSe junctions 15 p0289 A77-34117

## GARBAGE

- The solution of the garbage problem: New proposals for the utilization of refuse - Proposals and suggestions --- materials recycling and energy production facilities 13 p0015 A77-12061
- Use of municipal waste for fuel 15 p0291 A77-35149
- Refuse to energy Memphis style 15 p0292 A77-35156
- Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157
- Recovering resources from urban refuse by the Bureau of Mines processes 15 p0292 A77-35158

## GAS ANALYSIS

- Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer 13 p0062 A77-17541
- Measurement of the excess oxidant ratio in the combustion products of an MHD-generator 14 p0136 A77-20107
- Particulate sampling at high temperature and high pressure --- of coal conversion processes 15 p0293 A77-35172
- A multigas analyzer for automobile exhausts 15 p0297 A77-36026
- Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere [PB-253375/0] 13 p0092 N77-10715
- Cooperative study of heavy duty diesel emission measurement methods [PB-257137/0] 13 p0133 N77-15541
- Analysis of natural gases, 1975 [PB-259351/5] 14 p0228 N77-20197
- Determination of hydrogen sulfide in refinery fuel gases [PB-268240/9] 16 p0543 N77-32277
- GAS CHROMATOGRAPHY**
- Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262
- GAS COMPOSITION**
- On the production of town gas from off-gases of the chemical processing industry 14 p0164 A77-23099
- Fundamentals of coal gasification 15 p0308 A77-36809
- Metallurgical evaluation of materials for geothermal power plant applications 16 p0499 A77-49700
- Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB-255317/0] 13 p0110 N77-12597
- GAS COOLED FAST REACTORS**
- Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide 13 p0058 A77-16213
- GAS COOLING**
- Gas-interface studies in large horizontal heat pipes [LA-6646-MS] 16 p0520 N77-29455
- GAS DETECTORS**
- Development of fuel cell CO detection instruments for use in a mine atmosphere [PB-254823/8] 13 p0095 N77-11380
- Environmental protection measuring technique. Sensor for automatic continuous emission control of gases [BMFT-FE-T-76-03] 14 p0209 N77-16467
- GAS DISSOCIATION**
- Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770
- Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide 13 p0058 A77-16213
- Hydrogen production from water by means of chemical cycles 13 p0058 A77-16471
- GAS EVOLUTION**
- Gas release during long-term operation of heat pipes 13 p0050 A77-14328
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 15 p0277 A77-33359
- Microbial hydrogen production 15 p0278 A77-33367
- The photosynthetic production of hydrogen 15 p0278 A77-33368
- Hydrogen vehicular fuel storage as a step in a water splitting cycle 15 p0280 A77-33381
- Fuel gas from landfill 15 p0314 A77-37661
- An economic assessment of fuelgas from water hyacinths 15 p0314 A77-37663
- Gas production from micro algae 15 p0314 A77-37665

- The PUROX System --- solid waste partial oxidation to fuel gas  
15 p0315 A77-37671
- Pressurized fluidized-bed coal combustion  
16 p0454 A77-48788
- GAS EXPLOSIONS**  
Investigation of a coaxial explosion-type MHD generator  
15 p0268 A77-32313
- GAS FLOW**  
Investigation of gas-controlled heat pipes with reservoirs of constant and variable volume  
13 p0050 A77-14327
- Drag reduction in cocurrent horizontal natural gas-hexane pipe flow  
16 p0519 A77-29441
- GAS GENERATORS**  
Onboard hydrogen generation for automobiles  
13 p0020 A77-12663
- Energy conversion via photoelectrolysis  
13 p0021 A77-12667
- Hydrogen production by the steam-iron process  
13 p0023 A77-12688
- Operation of the Westinghouse Coal Gasification Process Development Unit  
13 p0023 A77-12689
- Electrochemical power and hydrogen generation from high temperature electrolytic cells  
13 p0025 A77-12709
- Hydrogen production using solar radiation  
13 p0048 A77-13540
- Hydrogen production via thermochemical cycles based on sulfur chemistry  
13 p0048 A77-13541
- An alternative fuel for cars --- hydrogen production and storage  
13 p0050 A77-14530
- The K-T process - Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries  
15 p0275 A77-33338
- Potential structural material problems in a hydrogen energy system  
15 p0281 A77-33389
- China claims lead in biogas energy supply  
15 p0297 A77-36050
- Fuel gas production via Koppers-Totzek gasification - An economic analysis  
15 p0301 A77-36336
- Winkler technology for clean fuels from coal  
15 p0301 A77-36337
- Fuel gas and electricity from municipal sewage  
15 p0314 A77-37658
- Development of the Westinghouse coal gasification process - A status report  
16 p0446 A77-48722
- A technical scale gas generator for steam gasification of coal using nuclear heat  
16 p0502 A77-50255
- General Electric prepares the LM5000 for testing  
16 p0505 A77-51169
- Hydrogen-rich gas generator [NASA-CASE-NPO-13560-1]  
13 p0086 A77-10636
- Effective conversion processes between thermal and chemical energies: Thermodynamic study of multistep water decomposition processes  
14 p0238 A77-21576
- Laboratory investigations on thermochemical hydrogen production  
14 p0238 A77-21580
- Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process  
14 p0238 A77-21582
- The Westinghouse sulfur cycle for the thermochemical decomposition of water  
14 p0238 A77-21587
- Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle  
14 p0238 A77-21589
- Recent developments of large electrolytic hydrogen generators  
14 p0238 A77-21592
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
14 p0238 A77-21593
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks  
14 p0239 A77-21599
- Microbial hydrogen production  
14 p0239 A77-21601
- GAS HEATING**  
Progress on the testing of refractories for directly-fired MHD air heater service. II  
15 p0328 A77-39544
- Experimental test of gas heat transfer system for hydroxide heat storage [AI-EBDA-13176]  
15 p0381 A77-26655
- GAS INJECTION**  
Neutral injection at PPPL, past and present --- in toroidal plasma devices  
16 p0407 A77-41698
- Performance characteristics of a diesel engine using low- and medium-energy gases as a fuel supplement (fumigation) [NASA-TN-X-58188]  
13 p0126 A77-14955
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline  
14 p0243 A77-21629
- GAS IONIZATION**  
Study of the ionization of the additive in MHD installations  
13 p0002 A77-10424
- Design of closed-cycle MHD generator with nonequilibrium ionization and system  
15 p0303 A77-36381
- Non equilibrium ionization in a linear magnetohydrodynamic generator, using a high pressure supersonic argon flow  
15 p0309 A77-36817
- MHD power generation with fully ionized seed  
16 p0443 A77-48571
- GAS JETS**  
The influence of the Reynolds number on the profiles of velocity and concentration in free jets of different density  
13 p0065 A77-18500
- GAS MIXTURES**  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- Hydrogen by electrolysis to supplement pipeline gas supplies Technical and economic aspects [AIAA 77-1032]  
16 p0405 A77-41569
- Hydrogen-rich gas generator [NASA-CASE-NPO-13560-1]  
13 p0086 A77-10636
- Water induction in hydrogen-powered IC engines  
14 p0243 A77-21631
- Comprehensive report and investigation on helium uses [PB-263515/9]  
15 p0370 A77-25280
- GAS PRESSURE**  
Pressure drawdown and buildup analyses in geothermal reservoirs  
13 p0030 A77-12753
- Mathematical simulation of the fixed-bed pressurized gasification process  
14 p0164 A77-23097
- Development of an assessment methodology for geopressured zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in South Texas [COO-2687-4]  
14 p0215 A77-18564
- GAS REACTORS**  
Desulfurization of flue gases with iron/III/ oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions --- German book  
13 p0080 A77-19184
- GAS RECOVERY**  
Fuel gas recovery from controlled landfilling of municipal wastes  
13 p0070 A77-18739
- Methane gas recovery from sanitary landfills in Southern California  
14 p0182 A77-26077
- Study of the feasibility of a regional solid waste derived fuel system in the Tennessee Valley Authority service area [PB-259764/9]  
14 p0227 A77-19956
- GAS SPECTROSCOPY**  
Measurements of Sc I gf-values --- absorption spectroscopy using heat pipe oven  
13 p0058 A77-16270

Boundary layer measurements of temperature and electron number density profiles in a combustion MHD generator 15 p0288 A77-33710

Determination of SO<sub>2</sub> concentrations from a coal-burning power plant stack by Fourier spectrometry 15 p0296 A77-36024

**GAS TEMPERATURE**

The analysis of the temperature regimes of the operation of a gas-regulated heat pipe 13 p0064 A77-17924

Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases 14 p0195 A77-28050

**GAS TRANSPORT**

Energy transmission from ocean thermal energy conversion plants 13 p0032 A77-12773

National gas flow patterns 1975: Geographic flow patterns and intercompany relationships [PB-26611/4] 16 p0512 A77-28328

**GAS TURBINE ENGINES**

Evolution of thermal traction - From the diesel engine to the gas turbine 13 p0004 A77-10976

Heat-pipe regenerator for gas turbine engine 13 p0020 A77-12528

A conceptual design study of closed Brayton cycle gas turbines for fusion power generation 13 p0022 A77-12676

Steam station repowering - A near-term method of energy conservation 13 p0022 A77-12679

Compressed air energy storage - A near term option for utility application 13 p0027 A77-12727

Combined cycles and refined coal --- gasification plant using high temperature gas turbines 13 p0058 A77-16249

High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591

Theoretical aspects of optimization of aviation gas turbine engine design variables 13 p0063 A77-17762

Gas turbine electric powerplants [AIAA PAPER 77-346] 13 p0066 A77-18254

Amtrak's newest turboliners 14 p0138 A77-20699

Air transport propulsion for the 1980's 14 p0138 A77-20717

Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids 14 p0145 A77-21623

Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile --- for coal-fired gas turbines 14 p0145 A77-21698

Small gas turbines and the Total Energy concept 14 p0156 A77-22024

Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels 14 p0177 A77-24852

Upgrading coal liquids to gas turbine fuels. III - Exploratory process studies 14 p0178 A77-24853

Recent tests of industrial gas turbine combustors fueled with simulated low heating value coal gas [ASME PAPER 76-WA/GT-3] 14 p0185 A77-26459

A new 10,000-hp gas turbine engine for industrial service [ASME PAPER 77-GT-4] 14 p0197 A77-28524

Design considerations for heat recovery system for DD-963 class ship [ASME PAPER 77-GT-106] 14 p0197 A77-28616

Influence of the intended use of an aircraft on the optimal parameters of gas-turbine power plants 15 p0266 A77-32086

Future propulsion plants. I 15 p0268 A77-32251

Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply 15 p0272 A77-33170

Development of low-power gas turbines with regenerative heat exchangers at MTU. I 15 p0289 A77-34122

Aviation turbine fuels from shale and coal oils 15 p0291 A77-35150

Modeling aspects of a gas turbine solar-electric power system 15 p0318 A77-38210

The development of small regenerative gas turbines at MTU. II 16 p0401 A77-41258

Gas turbine BTGR - A total energy utilization option --- High Temperature Gas-cooled Reactor [AIAA 77-1016] 16 p0403 A77-41560

Gas turbines - Status and prospects; Proceedings of the Symposium, London, England, February 4, 5, 1976 16 p0428 A77-46401

Gas turbine evolution 16 p0429 A77-46402

Designing gas turbines for the industrial and marine field 16 p0429 A77-46404

The industrial gas turbine - Its status and prospects 16 p0429 A77-46408

A new maintenance concept applied in the design of a new industrial gas turbine in the 100 MW class 16 p0429 A77-46410

Some observations on the selection of gas turbine generating plant 16 p0429 A77-46413

The ERDA automotive gas turbine program 16 p0443 A77-48703

Conceptual design of closed Brayton cycle for coal-fired power generation 16 p0445 A77-48714

Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant 16 p0445 A77-48717

System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications 16 p0445 A77-48718

A ceramic heat exchanger for exhaust fired gas turbine power cycles 16 p0445 A77-48719

ERDA/P&WA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology 16 p0446 A77-48721

Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723

The solid-fuel gas turbine for industrial energy production 16 p0453 A77-48785

Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design 16 p0461 A77-48844

Conceptual design of an open cycle gas turbine solar central receiver system 16 p0481 A77-49022

Development of a turbine rotor of silicon nitride 16 p0503 A77-50651

Heavy-fuel flame radiation in gas turbine combustors - Exploratory results 16 p0508 A77-51589

Ceramic materials and components for small automotive gas turbine engine [AD-A025472] 13 p0095 A77-11417

Emissions and performance of catalysts for gas turbine catalytic combustors [NASA-TN-X-73543] 13 p0104 A77-12406

High temperature gas turbine engine [FE-1765-8] 13 p0120 A77-14488

High temperature gas turbine engine component materials testing program [FE-1765-7] 13 p0127 A77-15401

Variable Geometry and Multicycle Engines [AGARD-CP-205] 15 p0339 A77-22112

Advanced engine design concepts and their influence on the performance of multi-role combat aircraft 15 p0339 A77-22116

Variable cycle engines for V/STOL fighters 15 p0339 A77-22117

Variable cycle engine applications and constraints --- for commercial and military (fighter) aircraft 15 p0339 A77-22125

- High efficiency engine cycles for air transport fuel economy 15 p0339 N77-22126
- Variable geometry in the gas turbine - the variable pitch fan engine 15 p0339 N77-22128
- Variable flow turbines 15 p0340 N77-22142
- Experience with a one stage variable geometry axial turbine 15 p0340 N77-22143
- Oil cooling system for a gas turbine engine [NASA-CASE-LEW-12830-1] 15 p0353 N77-23106
- Ceramics for the advanced automotive gas turbine engine: A look at a single shaft design [NASA-TM-X-73651] 15 p0354 N77-23490
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 1: Summary and combined gas-stream turbine plant with an integrated low-BTU gasifier [NASA-CR-134942-VOL-1] 15 p0379 N77-26628
- Braxton isotope power system. Phase 1: (Ground demonstration system) Configuration Control Document (CCD) [TID-27252] 15 p0380 N77-26644
- Thermal barrier coating on high temperature industrial gas turbine engines [NASA-CR-135147] 15 p0390 N77-27496
- Analysis of regenerated single-shaft ceramic gas-turbine engines and resulting fuel economy in a compact car [NASA-TM-X-3531] 16 p0521 N77-29607
- Study and program plan for improved heavy duty gas turbine engine ceramic component development [NASA-CR-135230] 16 p0542 N77-32033
- GAS TURBINES**
- ERDA's gas turbine development program for the next decade 13 p0011 A77-11324
- Solids gasification for gas turbine fuel 100 and 300 Btu gas 13 p0022 A77-12685
- Combination power plants for improved utilization of fossil fuels 13 p0045 A77-12939
- A combined cycle with a partial-oxidation reactor 13 p0062 A77-17534
- Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator 14 p0136 A77-20109
- The helium turbine - A power station of the future 14 p0138 A77-20951
- 10 MW solar thermal electric power plant design for solar day operation 14 p0153 A77-21842
- A modular fixed-mirror Brayton-cycle solar power system 14 p0154 A77-21846
- 100 MW large industrial gas turbine 14 p0155 A77-22022
- Combined gas/steam cycle power and heat generating plants 14 p0155 A77-22023
- The gas turbine --- French book 14 p0162 A77-22921
- Coal gasifier projects gather momentum 14 p0184 A77-26290
- Implications of utilizing synthetic fuels in combined cycles 14 p0193 A77-27301
- Coal gasification power generation 15 p0310 A77-37000
- What price wind power --- wind turbine efficiencies 15 p0310 A77-37248
- MHD systems with low cooling requirements 15 p0332 A77-39575
- The spacing of wind turbines in large arrays 16 p0416 A77-42893
- Investigating the starting modes of the GT-35 gas turbine plant --- turbocompressor tests 16 p0426 A77-45324
- Testing the annular combustor of the NK-8 aero-engine on natural gas --- for stationary gas turbine installation 16 p0426 A77-45325
- Some contributions to aerodynamic theory for vertical axis wind turbines 16 p0467 A77-48897
- Experimental data and theoretical analysis of an operating 100 kW wind turbine 16 p0467 A77-48898
- Fluid dynamics of diffuser augmented wind turbines 16 p0467 A77-48899
- Technical feasibility of a modular dish solar electric system 16 p0483 A77-49034
- Improvements in energy conversion technology 16 p0505 A77-51154
- General Electric prepares the LM5000 for testing 16 p0505 A77-51169
- A new approach to planning with gas turbines [ASME PAPER 77-JPGC-GT-3] 16 p0509 A77-51623
- The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification [ASME PAPER 77-JPGC-GT-7] 16 p0509 A77-51624
- Reduction of gaseous pollutant emissions from gas turbine combustors using hydrogen-enriched jet fuel [NASA-CR-149146] 13 p0094 A77-11198
- Automotive gas turbine fuel control [NASA-CASE-LEW-12785-1] 13 p0113 N77-13426
- Design phase utility analysis for gas turbine and combined cycle plants [PB-256665/1] 13 p0115 N77-13553
- Proceedings of the Stationary Source Combustion Symposium. Volume 3: Field Testing and Surveys [PB-257146/1] 13 p0125 N77-14643
- The pros and cons of variable geometry turbines 15 p0340 N77-22140
- Potential improvements in engine performance using a variable geometry turbine 15 p0340 N77-22141
- Baseline gas turbine development program [COO-2749-15] 15 p0390 N77-27410
- Gas turbine HTGR program [GA-A-14097] 15 p0393 N77-27539
- GAS-GAS INTERACTIONS**
- An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 15 p0283 A77-33406
- GAS-LIQUID INTERACTIONS**
- Hydrogenation of lignite with synthesis gas 14 p0201 A77-29525
- GAS-METAL INTERACTIONS**
- Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems 15 p0337 A77-40028
- Development of nondestructive evaluation methods for coal-conversion systems [CONF-760472-2] 14 p0216 N77-18567
- GAS-SOLID INTERFACES**
- Gas-solid heat transfer coefficients in beds of crushed oil shale 14 p0196 A77-28472
- A method of comparing flat-plate air and liquid solar collectors for use in space heating applications 16 p0472 A77-48941
- GASDYNAMIC LASERS**
- Recent results in the research area 'energetics' with respect to nonnuclear energy research 14 p0200 A77-29300
- GASEOUS DIFFUSION**
- Chromatographic determination of adsorption and diffusion in a bidispersed porous solid [LBL-5273] 16 p0532 N77-31269
- GASEOUS FUELS**
- Fuel gas recovery from controlled landfilling of municipal wastes 13 p0070 A77-18739
- Torrax - A system for recovery of energy from solid waste. F. J. Page 15 p0293 A77-35163
- Producer gas from agricultural wastes - Its production and utilization in a converted oil-fired boiler 15 p0323 A77-39106
- Gasification - Theory and application --- of coal 16 p0402 A77-41448
- A supplementary fuel for power generation /Ames, Iowa/ --- solid waste recovery system 16 p0433 A77-47214

## GASES

- Geothermal water and gas: Collected methods for sampling and analysis: Comment issue [BNWL-2094] 14 p0249 N77-21679
- Technology and economics of flue gas NOx oxidation by ozone [PB-261917/9] 15 p0350 N77-22700
- GASIFICATION**
- Solids gasification for gas turbine fuel 100 and 300 Btu gas 13 p0022 A77-12685
- Hydrogasification of oil shale 14 p0169 A77-23556
- Tertiary oil production process 14 p0196 A77-28520
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 15 p0284 A77-33409
- Economics of synthetic gas production by the SEGAS process 15 p0302 A77-36341
- Synthetic natural gas from animal wastes by anaerobic fermentation 15 p0314 A77-37660
- Large scale hydrogen production utilizing carbon in renewable resources 15 p0321 A77-38527
- Producer gas from agricultural wastes - Its production and utilization in a converted oil-fired boiler 15 p0323 A77-39106

## GASOLINE

- Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process 13 p0023 A77-12691
- Air, water, nuclear power make gasoline 13 p0045 A77-12935
- Mobil process for the conversion of methanol to gasoline 14 p0193 A77-27299
- Methanol gasoline blends - Future automotive fuels 15 p0273 A77-33300
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392
- A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen 15 p0302 A77-36343
- Gasoline and distillate shortage situation: 1972-1976 [PB-253322/2] 13 p0089 N77-10670
- Potential for producing and marketing gasoline substitutes from western coal [BNWL-2080 (RAP-4)] 15 p0340 N77-22291
- Performance of Army engines with unleaded gasoline-field study evaluation [AD-A032075] 15 p0342 N77-22490
- Conversion of waste organic material to gasoline [COO-2982-7] 15 p0377 N77-26325
- Experimental results using methanol and methanol/gasoline blends as automotive engine fuel [BERC/RI-76/15] 15 p0389 N77-27245
- Energy industry investigation. Part 2: Industry structure [GPO-83-695] 15 p0391 N77-27500
- Petroleum situation reports 1974-1975 [PB-265848/2] 16 p0513 N77-28573
- Study of gasoline vapor emission controls at small bulk plants [PB-267096/6] 16 p0549 N77-32638
- Overview and review of motor gasoline desulfurization, volume 1 [BERC/RI-76/17-VOL-1] 16 p0551 N77-33377
- Motor gasoline desulfurization study, volume 2 [BERC/RI-76/17-VOL-2] 16 p0551 N77-33378
- Reliability study of vapor recovery systems at service stations [PB-267613/8] 16 p0560 N77-33700
- GENERAL AVIATION AIRCRAFT**
- Technical highlights in general aviation [AIAA PAPER 77-312] 13 p0066 A77-18237
- Automotive engines - A viable alternative for aircraft [SAE PAPER 770466] 15 p0310 A77-37084
- The impact of the energy crisis on the demand for fuel efficiency - The case of general aviation 16 p0410 A77-42038

- NASA Quiet Clean General Aviation Turbofan (QCGAT) program status [NASA-TM-X-73564] 15 p0353 N77-23109

## GEOCHEMISTRY

- The utility of waters from the high-temperature areas in Iceland for space heating as determined by their chemical composition 13 p0012 A77-11496
- Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497
- Locating interesting geothermal areas in the Tuscany region /Italy/ by geochemical and isotopic methods 13 p0013 A77-11498
- The nature and characteristics of the distribution of helium and argon isotopes in the geothermal waters of the Kuril Islands and Kamchatka 13 p0048 A77-13589
- Cooperative geochemical resource assessment of the Mesa Geothermal system [PB-257225/3] 13 p0132 N77-15520
- Geothermal studies in northern Nevada [LBL-4451] 14 p0221 N77-19589
- Geochemistry and hydrothermal alteration at selected Utah hot springs, volume 3 [PB-264415/1] 15 p0378 N77-26606
- GEOELECTRICITY**
- Geothermal significance of magnetotelluric sounding in the eastern Snake River Plain-Yellowstone region 15 p0310 A77-36999

## GEOLOGICAL FAULTS

- The Los Alamos Scientific Laboratory Dry Hot Rock Geothermal Project /LASL Group Q-22/ 14 p0163 A77-23032

## GEOLOGICAL SURVEYS

- Remote sensing of an underground coal-burn cavity with a wide-band induction system 13 p0007 A77-11050
- World oil resources. III - The geological analogy method 13 p0012 A77-11341
- The utility of waters from the high-temperature areas in Iceland for space heating as determined by their chemical composition 13 p0012 A77-11496
- Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497
- Locating interesting geothermal areas in the Tuscany region /Italy/ by geochemical and isotopic methods 13 p0013 A77-11498
- Results of some geothermal studies in Singbhum thrust belt, India 13 p0013 A77-11499
- Use of radar in geology 13 p0018 A77-12256
- In situ combustion of Michigan oil shale - Current field studies 13 p0024 A77-12695
- Geothermal flux through palagonitized tephra, Surtsey, Iceland - The Surtsey temperature-data-relay experiment via Landsat-1 13 p0048 A77-13648
- Geothermal significance of magnetotelluric sounding in the eastern Snake River Plain-Yellowstone region 15 p0310 A77-36999
- Pacific Northwest geothermal: 1976 review, 1977 outlook 15 p0335 A77-39817
- Geothermal studies in northern Nevada [LBL-4451] 14 p0221 N77-19589
- Evaluation and targeting of geothermal energy resources in the southeastern United States [VPI-SO-5103-1] 14 p0225 N77-19642
- Methods for geothermal reservoir detection emphasizing submerged environments [LBL-4495] 14 p0236 N77-21532
- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] 16 p0527 N77-30589

## GEOLOGY

- The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 --- Bolivia  
[E77-10028] 13 p0096 A77-11491
- Petrology and geochemistry of hydrothermal alteration in borehole Mesa 6-2, East Mesa geothermal area, Imperial Valley, California [PB-258671/3] 14 p0215 A77-18541
- Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 A77-18562

## GEOMORPHOLOGY

- The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 --- Bolivia  
[E77-10028] 13 p0096 A77-11491

## GEOPHYSICAL OBSERVATORIES

- Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories  
16 p0433 A77-47201

## GEOPHYSICS

- Prospecting for geothermal energy by geophysical methods  
16 p0499 A77-49575
- Geothermal studies in northern Nevada [LBI-4451] 14 p0221 A77-19589
- Use of electrical methods for the delineation of geothermal reservoirs [PB-2615C7/8] 15 p0351 A77-22750
- Dipole-dipole resistivity surveys, Roosevelt hot springs KGRA, volume 2 [PB-264897/0] 15 p0371 A77-25623
- Geophysical fluid dynamics background for ocean thermal power plants [DSE/1005-1] 16 p0555 A77-33624

## GEOTHERMAL ENERGY CONVERSION

- Making electricity from moderate temperature fluids --- geothermal sources  
13 p0002 A77-10649
- Geothermal energy --- conversion technology development  
13 p0005 A77-11035
- Geothermal energy in Hawaii - Hydrothermal systems  
13 p0029 A77-12741
- Application of the Stretford process for H<sub>2</sub>S abatement at the Geysers geothermal power plant  
13 p0029 A77-12743
- Economic optimization of binary fluid cycle power plants for geothermal systems  
13 p0029 A77-12744
- Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis  
13 p0029 A77-12745
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle  
13 p0029 A77-12746
- Direct contact heat exchangers for geothermal power plants  
13 p0029 A77-12747
- Fluidized bed heat exchangers for geothermal applications  
13 p0029 A77-12748
- The economic generation of electricity from moderate temperature geothermal resources  
13 p0030 A77-12749
- Comparison of geothermal power conversion cycles  
13 p0030 A77-12750
- Power production from high temperature geothermal waters  
13 p0030 A77-12751
- Preliminary analysis of electric generation utilizing geopressured geothermal fluids  
13 p0030 A77-12752
- Geothermal powered heat pumps to produce process heat  
13 p0030 A77-12754
- Extracting energy from hydraulically-fractured geothermal reservoirs  
13 p0030 A77-12757
- The use of program GEOTHM to design and optimize geothermal power cycles  
13 p0031 A77-12758

- Electric utility companies and geothermal power  
13 p0031 A77-12759
- The potential national benefits of geothermal electrical energy production from hydrothermal resources in the West  
13 p0031 A77-12760
- Geothermal sources and their utilization  
13 p0055 A77-15803
- Geothermal power - The 'sleeper' in the energy race  
13 p0056 A77-15845
- A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems  
13 p0058 A77-16306
- Geothermal energy as a source of electric power: Thermodynamic and economic design criteria --- Book  
13 p0060 A77-16623
- Geothermal energy development  
13 p0064 A77-17801
- Liquid flow pattern in extraction of geothermal energy  
14 p0135 A77-19706
- Problems related to operating thermal wells subject to scaling in Hungary  
14 p0163 A77-23035
- Flow in geothermal hot water wells  
14 p0163 A77-23037
- Interaction of hot water reservoirs and deep wells  
14 p0163 A77-23038
- Future energy production systems: Heat and mass transfer processes. Volume 2 --- Book  
14 p0174 A77-24201
- Problems of heat and mass transfer in geothermal energetics  
14 p0174 A77-24202
- Heat transport in geothermal systems  
14 p0174 A77-24203
- Recovery of heat energy from deep or shallow aquifers  
14 p0175 A77-24206
- Utilization of heat of geothermal springs and waste hot waters in freon-operated power plants  
14 p0175 A77-24207
- Possible applications of geothermal energy in France  
14 p0175 A77-24208
- Some aspects of heat and mass transfer in geothermal wells  
14 p0175 A77-24209
- Heat and mass transfer problems associated with alternative energy production  
14 p0176 A77-24216
- 'Low-energy' geothermal heat  
14 p0178 A77-25001
- East Mesa Geothermal Component Test Facility  
14 p0178 A77-25136
- Power production from high salinity geothermal waters  
14 p0183 A77-26090
- Geothermal energy development  
14 p0194 A77-27881
- Thermal efficiency of geothermal power  
14 p0205 A77-29788
- Alternative energy sources --- Book  
15 p0261 A77-31467
- Geothermal power utilization, present and future  
15 p0262 A77-31475
- Regenerative energy sources --- energy conversion and utilization feasibility  
15 p0263 A77-31577
- Present status of resources development --- of geothermal energy in world nations  
15 p0286 A77-33523
- An update of world geothermal energy development  
15 p0286 A77-33524
- Mercury emissions from geothermal power plants  
15 p0289 A77-34428
- Utilizing alternative energy sources in France  
15 p0296 A77-35923
- Geothermal heat - instead of electrically powered compression - proposed for cooling a small residence or office building  
15 p0335 A77-39818
- Perspectives of geothermal energy in France  
16 p0399 A77-40512
- Calcite-aragonite deposition in geothermal wells  
16 p0418 A77-43025

- Recovery of energy from fracture-stimulated geothermal reservoirs 16 p0424 A77-44604
- Geothermal energy - Tapping nature's boiler room 16 p0437 A77-47600
- Geothermal well stimulation with a secondary fluid 16 p0454 A77-48795
- Geothermal space heating - The symbiosis with fossil fuel 16 p0455 A77-48797
- Energy extraction characteristics of hot dry rock geothermal systems 16 p0455 A77-48798
- Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations --- for geothermal applications 16 p0455 A77-48799
- A comparison of three working fluids for the design of geothermal power plants 16 p0455 A77-48800
- The use of mixture working fluids in geothermal binary power cycles 16 p0455 A77-48802
- Geothermal power cycle analysis 16 p0455 A77-48803
- Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804
- Effect of reservoir temperature decline on geothermal power plant design and economics 16 p0456 A77-48805
- Using Salton Sea Geothermal brines for electrical power: A review of progress in chemistry and materials technology - 1976 Status 16 p0469 A77-48908
- Metallurgical evaluation of materials for geothermal power plant applications 16 p0499 A77-49700
- Geothermal energy for power generation [LA-UR-76-369] 13 p0087 N77-10650
- Geothermal energy for electrical and nonelectrical applications [LA-UR-76-418] 13 p0123 N77-14601
- Economics of geothermal electricity generation from hydrothermal resources [BNWL-1989] 13 p0123 N77-14602
- Geothermal R and D project report [ANCR-1283] 13 p0124 N77-14605
- First Workshop on Sampling Geothermal Effluents [PB-258067/8] 14 p0207 N77-16433
- Conceptual study for total utilization of an intermediate temperature geothermal resource [ANCR-1260] 14 p0211 N77-17579
- Geothermal component test facility [UCID-27035] 14 p0211 N77-17580
- Performance test of a bladeless turbine for geothermal applications [UCID-17068] 14 p0212 N77-17581
- Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 N77-18562
- Geothermal energy program, current research projects supported by the national science foundation [PB-258948/9] 14 p0218 N77-18597
- Potential national benefits of geothermal electrical energy production from hydrothermal resources in the West [BNWL-SA-5798] 14 p0220 N77-19583
- Helical-rotor expander applications for geothermal energy conversion [UCRL-52043] 14 p0221 N77-19586
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle [UCRL-78390] 14 p0221 N77-19587
- Geothermal studies in northern Nevada [LBL-4451] 14 p0221 N77-19589
- Potential benefits of geothermal electrical production from hydrothermal resources [BNWL-2001] 14 p0221 N77-19591
- Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing [LA-UR-76-1672] 14 p0221 N77-19597
- Extracting energy from hydraulically-fractured geothermal reservoirs [LA-UR-76-848] 14 p0221 N77-19598
- National plan for energy research, development and demonstration: Creating energy choices for the future. Volume 2: Program implementation --- fossil fuels, solar energy, and geothermal energy [BDDA-76-1-VOL-2] 14 p0222 N77-19600
- Geothermal R and D project report, 1 January - 31 March 1976 [ANCR-1319] 14 p0222 N77-19607
- Methodology for ranking geothermal reservoirs in non-electric industrial applications [HTR-7241] 14 p0222 N77-19610
- Modular 5 MW geothermal power plant design considerations and guidelines [UCRL-13684] 14 p0222 N77-19612
- Geothermal resources: Exploration and exploitation. A bibliography [TID-3354-R1] 14 p0249 N77-21676
- Proceedings of Second Geopressed Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3] 14 p0249 N77-21678
- Precipitation and scaling in dynamic geothermal systems [ORNL-TM-5649] 14 p0249 N77-21680
- Rankine cycle energy conversion system design considerations for low and intermediate temperature sensible heat sources [SAND-76-0363] 14 p0251 N77-21699
- Energy conversion and economics for geothermal power generation at Heber, California, Valles Caldera, New Mexico, and Ralt River, Idaho: Case studies [PB-261845/2] 14 p0251 N77-21712
- Energy for rural development: Renewable resources and alternative technologies for developing countries [PB-260606/9] 14 p0251 N77-21716
- Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir [PB-261562/3] 14 p0252 N77-21726
- Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir [PB-262391/6] 14 p0252 N77-21731
- Geothermal down-well pumping system [PB-261857/7] 14 p0252 N77-21732
- Geothermal chemistry activities at LASL [LA-6448-PR] 15 p0344 N77-22623
- User manual for GEOCOST: A computer model for geothermal cost analysis. Volume 2: Binary cycle version [BNWL-1942-V2] 15 p0345 N77-22632
- Recommendations for a US geothermal research plan, volume 1 [PB-261566/4] 15 p0346 N77-22640
- Geohydrological environmental effects of geothermal power production, phase 2A [PB-261687/8] 15 p0347 N77-22653
- Geothermal Energy and Wind Power: Alternate energy sources for Alaska [PB-261521/9] 15 p0349 N77-22678
- Geotechnical environmental aspects of geothermal power generation Heber, Imperial Valley, California [PB-260848/7] 15 p0349 N77-22680
- Conceptual design of a 10MW regenerative isobutane geothermal power plant [PB-261563/1] 15 p0349 N77-22683
- Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant [PB-261564/9] 15 p0349 N77-22684
- Geothermal technoeosystems and water cycles in arid lands [PB-263091/1] 15 p0354 N77-23592
- Regenerative vapor cycle with isobutane as working fluid [PB-262704/0] 15 p0356 N77-23622
- Study of silica scaling from geothermal brines [PB-262890/7] 15 p0357 N77-23626
- Optimization technique for geothermal power plants using a binary fluid cycle [BNWL-2155] 15 p0394 N77-27546
- Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 N77-28609
- Hydrogen sulfide stress corrosion cracking in materials for geothermal power [COO-2576-3] 16 p0519 N77-29269



# SUBJECT INDEX

# GEOTHERMAL RESOURCES

- Environmental assessment of geopressured waters and their projected uses [PB-268289/6] 16 p0544 A77-32579
- Planning and design of additional East Mesa Geothermal Test Facilities. Phase 1B, Volume 2: Procurement package [SAN/1140-1/2-VOL-2] 16 p0558 A77-33657
- GEOTHERMAL RESOURCES**
- Thermographic mosaic of Yellowstone National Park p0001 A77-10121
- Submarine geothermal resources 13 p0010 A77-11322
- The utility of waters from the high-temperature areas in Iceland for space heating as determined by their chemical composition 13 p0012 A77-11496
- Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497
- Locating interesting geothermal areas in the Tuscany region /Italy/ by geochemical and isotopic methods 13 p0013 A77-11498
- Results of some geothermal studies in Singbhum-thrust belt, India 13 p0013 A77-11499
- A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs 13 p0014 A77-11591
- Seasonal storage of thermal energy in water in the underground --- reservoirs 13 p0028 A77-12734
- Geothermal studies in northern Nevada 13 p0029 A77-12742
- Economic optimization of binary fluid cycle power plants for geothermal systems 13 p0029 A77-12744
- Pressure drawdown and buildup analyses in geothermal reservoirs 13 p0030 A77-12753
- Direct applications of geothermal energy 13 p0030 A77-12755
- Prerequisites for military/civilian geopressured geothermal resource development 13 p0031 A77-12761
- An engineering feasibility study of using low temperature geothermal sources in Colorado 13 p0031 A77-12762
- The nature and characteristics of the distribution of helium and argon isotopes in the geothermal waters of the Kuril Islands and Kamchatka 13 p0048 A77-13589
- Geothermal flux through palagonitized tephra, Surtsey, Iceland - The Surtsey temperature-data-relay experiment via Landsat-1 13 p0048 A77-13648
- Geothermal energy as a source of electric power: Thermodynamic and economic design criteria --- Book 13 p0060 A77-16623
- Geothermal energy development 13 p0064 A77-17801
- Geothermal energy in Saudi Arabia and its use in connection with solar energy 13 p0079 A77-19122
- Thermal convection of water in a porous medium - Effects of temperature- and pressure-dependent thermodynamic and transport properties --- for non-Boussinesq geothermal layers 14 p0145 A77-21546
- The Los Alamos Scientific Laboratory Dry Hot Rock Geothermal Project /LASL Group Q-22/ 14 p0163 A77-23032
- Research and development of geothermal energy production in Hungary 14 p0163 A77-23034
- Problems of heat and mass transfer in geothermal energetics 14 p0174 A77-24202
- Heat transport in geothermal systems 14 p0174 A77-24203
- Free thermal convection in geothermal fields - Physical understanding and mathematical modeling 14 p0174 A77-24204
- Numerical solutions for steady free convection in island geothermal reservoirs 14 p0174 A77-24205
- Utilization of heat of geothermal springs and waste hot waters in freon-operated power plants 14 p0175 A77-24207
- Some aspects of heat and mass transfer in geothermal wells 14 p0175 A77-24209
- The ERDA geothermal program 14 p0177 A77-24603
- 'Low-energy' geothermal heat 14 p0178 A77-25001
- Net energy delivery from geothermal resources 14 p0178 A77-25137
- More about geothermal steam or the hottest energy prospect ever --- Book 14 p0191 A77-26925
- Geothermal development and the Salton Sea 14 p0194 A77-27352
- Geothermal energy development 14 p0194 A77-27881
- Summary of 1976 geothermal drilling - Western United States 15 p0286 A77-33522
- Present status of resources development --- of geothermal energy in world nations 15 p0286 A77-33523
- An update of world geothermal energy development 15 p0286 A77-33524
- Potential land subsidence at geothermal development sites 15 p0286 A77-33525
- Institutional and environmental aspects of geothermal energy development 15 p0291 A77-35016
- Ground water as energy carrier 15 p0302 A77-36347
- The question of the utilization of geothermal energy in dry rocks /dry walls/ 15 p0303 A77-36348
- Geothermal significance of magnetotelluric sounding in the eastern Snake River Plain-Yellowstone region 15 p0310 A77-36999
- Pacific Northwest geothermal: 1976 review, 1977 outlook 15 p0335 A77-39817
- Recovery of energy from fracture-stimulated geothermal reservoirs 16 p0424 A77-44604
- Computing residuals in geothermal research by I.R. scanning 16 p0431 A77-46768
- Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26] 16 p0432 A77-46909
- Thermal properties of subsurface rocks in the Ukraine 16 p0443 A77-48647
- Pollution control in geothermal energy 16 p0452 A77-48772
- On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs 16 p0454 A77-48796
- Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California --- in geothermal resources exploitation 16 p0455 A77-48801
- Design and field test of a steam powered downhole geothermal pump 16 p0456 A77-48806
- A two-phase rotary separator demonstration system for geothermal energy conversion 16 p0456 A77-48807
- Performance of a total-flow impulse turbine for geothermal applications 16 p0456 A77-48808
- The helical screw expander evaluation project --- for geothermal wells 16 p0456 A77-48809
- New turbodrill for geothermal drilling 16 p0456 A77-48810
- Thermocorer for geothermal applications 16 p0456 A77-48811
- Prospecting for geothermal energy by geophysical methods 16 p0499 A77-49575
- On pressure-work, viscous dissipation and the energy balance relation for geothermal reservoirs 16 p0505 A77-51256

- Utilization of geothermal energy  
[UTIAS-REVIEW-40] 13 p0087 N77-10644
- Geothermal energy for power generation  
[LA-UR-76-369] 13 p0087 N77-10650
- Remote sensing of geothermic activities of the volcanoes Aetna, Stromboli and Vesuv by means of infra-red NOAA-VHRR-satellite data --- Italy  
13 p0104 N77-12485
- Heat extraction from hot dry rock masses  
[PB-256775/8] 13 p0116 N77-13556
- Explaining energy: A manual of non-style for the energy outsider who wants in  
[LBL-4458] 13 p0122 N77-14592
- Resource utilization efficiency improvement of geothermal binary cycles, phase 1  
[ORO-4944-3] 13 p0123 N77-14600
- Economics of geothermal electricity generation from hydrothermal resources  
[BNWL-1989] 13 p0123 N77-14602
- Electric power generation using geothermal brine resources for a proof-of-concept facility  
[NSF/RA/N-75-049] 13 p0123 N77-14603
- Utility distribution systems in Iceland  
[AD-A026956] 13 p0126 N77-14957
- Cooperative geochemical resource assessment of the Mesa Geothermal system  
[PB-257225/3] 13 p0132 N77-15520
- Overview of the Imperial Valley environmental project  
[UCID-17067] 13 p0132 N77-15533
- Materials research and evaluation for geothermal corrosion environments --- alloys  
[COO-2602-2] 14 p0210 N77-17216
- Conceptual study for total utilization of an intermediate temperature geothermal resource  
[ANCR-1260] 14 p0211 N77-17579
- Petrology and geochemistry of hydrothermal alteration in borehole Mesa 6-2, East Mesa geothermal area, Imperial Valley, California  
[PB-258871/3] 14 p0215 N77-18541
- A study of geothermal prospects in the western United States  
[NASA-CR-149812] 14 p0220 N77-19575
- Potential benefits of geothermal electrical production from hydrothermal resources  
[BNWL-2001] 14 p0221 N77-19591
- Plan for developing moderate temperature/low salinity geothermal resources  
[ANCR-1318] 14 p0223 N77-19614
- Evaluation and targeting of geothermal energy resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642
- Drilling for energy resources  
[PB-259206/1] 14 p0235 N77-20972
- Methods for geothermal reservoir detection emphasizing submerged environments  
[LBL-4495] 14 p0236 N77-21532
- Geothermal resources: Exploration and exploitation. A bibliography  
[TID-3354-R1] 14 p0249 N77-21676
- Proceedings of Second Geopressed Geothermal Energy Conference. Volume 2: Resource Assessment  
[CONF-760222-P2] 14 p0249 N77-21677
- Geothermal water and gas: Collected methods for sampling and analysis: Comment issue  
[BNWL-2094] 14 p0249 N77-21679
- Geothermal energy resource utilization program planning  
[MFR-7137] 14 p0249 N77-21683
- Two-phase flow in geothermal energy sources  
[TID-27129] 14 p0250 N77-21689
- Workshop on Geothermal Reservoir Engineering  
[PB-261319/8] 14 p0251 N77-21709
- Geothermal hot water pump --- for use in reservoirs  
[PB-261741/3] 14 p0251 N77-21711
- Proceedings of 2nd Workshop on Materials Problems Associated with the Development of Geothermal Energy Systems  
[PB-261349/5] 14 p0252 N77-21725
- State policies for geothermal development. Uncovering a major resource  
[PB-261744/7] 14 p0252 N77-21728
- Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir  
[PB-262391/6] 14 p0252 N77-21731
- Concrete-polymer materials for geothermal applications  
[BNL-20865] 15 p0340 N77-22263
- The influence of lateral mass efflux on free convection boundary layers in a saturated porous medium  
[PB-261558/1] 15 p0342 N77-22587
- On shallow-hole temperature measurements. A test study in the Salton Sea geothermal field  
[PB-262643/0] 15 p0344 N77-22602
- Geothermal exploration: An evaluation of the microseismic groundnoise method  
[PB-262575/4] 15 p0343 N77-22603
- Geothermal chemistry activities at LASL  
[LA-6448-PR] 15 p0344 N77-22623
- Recommendations for a US geothermal research plan, volume 1  
[PB-261566/4] 15 p0346 N77-22640
- Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641
- Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642
- Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- Geothermal hot water pump, appendix  
[PB-262030/0] 15 p0347 N77-22652
- Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application  
[PB-262372/6] 15 p0347 N77-22654
- A coordinated exploration program for geothermal sources on the island of Hawaii  
[PB-261691/0] 15 p0350 N77-22685
- Use of electrical methods for the delineation of geothermal reservoirs  
[PB-261507/8] 15 p0351 N77-22750
- Telluric mapping over the Mesa Geothermal Anomaly, Imperial Valley, California  
[PB-262828/7] 15 p0355 N77-23593
- The Hawaii geothermal project, initial phase 2 progress report  
[PB-263120/8] 15 p0355 N77-23594
- Corrosivity of geothermal brines  
[ORNL-TM-5688] 15 p0359 N77-24265
- Mathematical modelling of single-phase nonisothermal fluid flow through porous media  
[PB-262884/0] 15 p0362 N77-24577
- The use of geothermal energy at military installations  
[AD-A034241] 15 p0366 N77-24626
- The analysis of subsidence associated with geothermal development. Volume 1: Handbook  
[PB-263692/6] 15 p0369 N77-24714
- The analysis of subsidence associated with geothermal development. Volume 2: Research report  
[PB-263693/4] 15 p0369 N77-24715
- The analysis of subsidence associated with geothermal development. Volume 3: Information bank  
[PB-263694/2] 15 p0369 N77-24716
- Program definition for the development of geothermal energy. Volume 1: Background and program definition summary  
[NASA-CR-153221] 15 p0371 N77-25612
- Program definition for the development of geothermal energy. Volume 2: Program definition development rationale and subprogram descriptions  
[NASA-CR-153222] 15 p0371 N77-25613
- Program definition for the development of geothermal energy. Volume 3: Appendixes  
[NASA-CR-153223] 15 p0371 N77-25614
- Dipole-dipole resistivity surveys, Roosevelt hot springs KGRA, volume 2  
[PB-264897/0] 15 p0371 N77-25623
- LASL hot dry rock geothermal project  
[LA-6525-PR] 15 p0372 N77-25639
- Geochemistry and hydrothermal alteration at selected Utah hot springs, volume 3  
[PB-264415/1] 15 p0378 N77-26606
- University of Utah direct contact Geothermal Power Project report. A computer program for determining the thermodynamic properties of water  
[UTEC-ME-76-171] 15 p0380 N77-26642
- Geothermal R and D project  
[TREE-1008] 15 p0393 N77-27538

- Computer simulation of geothermal reservoirs  
[PB-265104/0] 15 p0395 N77-27564
- Geothermal energy, an environmental and safety  
mini-overview survey  
[ATR-77 (7518)-1] 16 p0514 N77-28590
- Modeling and optimization of geothermal power  
plants using the binary fluid cycle  
[BNWL-2112] 16 p0521 N77-29609
- Energy Technologies for the West: Geothermal;  
Energy from the earth  
[TID-27431] 16 p0537 N77-31642
- Earthquake surveys of the Roosevelt Hot Springs  
and the Cove Fort areas, Utah, volume 4  
[PB-268421/5] 16 p0544 N77-32574
- Thermal gradient and heat flow drilling, volume 5  
[PB-268422/3] 16 p0544 N77-32577
- Gravity and ground magnetic surveys of the central  
mineral mountains, Utah, volume 6  
[PB-268423/1] 16 p0544 N77-32578
- Numerical simulation of United States Gulf Coast  
geothermal geopressured reservoirs  
16 p0545 N77-32585
- Beneficial uses of geothermal energy description  
and preliminary results for phase 1 of the Raft  
River irrigation experiment  
[TREE-1048] 16 p0547 N77-32609
- Unconventional energy sources  
[PB-268301/9] 16 p0548 N77-32617
- Energy in an oasis: Geothermal resource  
development in the Imperial Valley of California  
16 p0552 N77-33598
- GERMANIUM**  
Theoretical and experimental validation of new  
sources of electrical energy  
14 p0176 A77-24457
- High-efficiency thin-film GaAs solar cells  
[PB-258493/6] 14 p0212 N77-17599
- GERMANY**  
Energy policies of France, Britain, and Germany  
compared  
15 p0263 A77-31572
- Utilization of solar energy  
[ERDA-TR-144] 14 p0216 N77-18572
- Electric storage heating: The experience in  
England and Wales and in the Federal Republic of  
Germany  
[ANL-ES-50] 15 p0365 N77-24612
- Energy sources for tomorrow  
[ERDA-TR-226] 15 p0391 N77-27507
- GETTERS**  
Use of getters in evacuated solar collectors  
16 p0487 A77-49069
- GEYSERS**  
Application of the Stretford process for H<sub>2</sub>S  
abatement at the Geysers geothermal power plant  
13 p0029 A77-12743
- Geothermal power - The 'sleeper' in the energy race  
13 p0056 A77-15845
- GLACIERS**  
The Greenland hydropower as a source of  
electrolytic hydrogen  
15 p0285 A77-33416
- GLASS**  
A solar collector of glass  
14 p0148 A77-21792
- Performance measurements of a cylindrical glass  
honeycomb solar collector compared with  
predictions  
[ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508
- The effect of dropwise condensation on glass solar  
properties  
16 p0422 A77-44485
- Reflection coefficient for a back-surface glass  
mirror --- of solar collectors  
16 p0488 A77-49072
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 11: Glass industry  
[PB-264277/5] 15 p0384 N77-26688
- Design problems associated with the use of  
evacuated glass receivers for solar collectors  
[CONF-7606128-1] 15 p0393 N77-27536
- GLASS FIBER REINFORCED PLASTICS**  
Fiber glass super flywheels  
14 p0157 A77-22143
- Materials and processing approaches to cost  
competitive wind turbine rotor blades  
14 p0157 A77-22144
- GLASS FIBERS**  
Fiber composite program for flywheel applications  
[UCRL-50033-76-1] 15 p0345 N77-22633
- GLOBAL AIR POLLUTION**  
Atmospheric carbon dioxide variations at the South  
Pole  
13 p0067 A77-18439
- GLYCOLS**  
Anodic oxidation of ethylene glycol with noble  
metal alloy catalysts --- in fuel cell  
15 p0260 A77-31171
- Inhibited ethylene glycol as the solar nexus  
15 p0270 A77-32601
- GOLD COATINGS**  
Particulate nature of solar absorbing films - Gold  
black  
14 p0163 A77-22982
- The power conversion efficiency of the  
gold-Rhodamine B-gold photoelectrochemical cell  
16 p0406 A77-41583
- GOVERNMENT PROCUREMENT**  
United States Postal Service Electric Vehicle  
Program  
14 p0161 A77-22912
- Report of the Presidential task force on reform of  
Federal Energy Administration regulations,  
volume 1  
[PB-262181/1] 15 p0347 N77-22649
- Federal support for the development of alternative  
automotive power systems: The general issue and  
the stirling, diesel, and electric cases  
[PB-263523/3] 15 p0354 N77-23518
- A federal procurement plan to accelerate use of  
solar energy  
[PB-263369/1] 15 p0356 N77-23618
- Second quarterly report to US House and Senate  
Committees on Appropriations  
[PB-263418/6] 15 p0365 N77-24616
- GOVERNMENT/INDUSTRY RELATIONS**  
The ERDA geothermal program  
14 p0177 A77-24603
- Energy conservation in the investment policies of  
French firms. I - Formulation of the problem  
15 p0324 A77-39504
- Impact of air quality regulation on the electric  
power industry  
16 p0452 A77-48775
- Stimulation of the solar industry by way of the  
Federal Buildings Program  
16 p0462 A77-48850
- Analysis of state solar energy options  
[PB-254730/5] 13 p0091 N77-10688
- Influence of selected Federal statutes on energy  
development  
[BNWL-2084 (RAP-5)] 15 p0346 N77-22638
- Program definition for the development of  
geothermal energy. Volume 1: Background and  
program definition summary  
[NASA-CR-153221] 15 p0371 N77-25614
- Program definition for the development of  
geothermal energy. Volume 2: Program  
definition development rationale and subprogram  
descriptions  
[NASA-CR-153222] 15 p0371 N77-25613
- Federal energy information gathering activities:  
A report to the President of the United States,  
and the Energy Resources Council  
[PB-262844/4] 15 p0374 N77-25668
- GOVERNMENTS**  
Perspective on energy policy  
[PB-261736/3] 15 p0348 N77-22674
- Improving regulatory effectiveness in  
Federal/State siting actions. Alternative  
financing methods  
[PB-269390/1] 16 p0547 N77-32606
- GRAIN BOUNDARIES**  
Reducing grain-boundary effects in polycrystalline  
silicon solar cells  
13 p0014 A77-11761
- Reduction of grain boundary recombination in  
polycrystalline silicon solar cells  
14 p0181 A77-25999
- Efficiency calculations for thin-film  
polycrystalline semiconductor Schottky barrier  
solar cells  
15 p0258 A77-30723

## GRAINS (FOOD)

- Grain drying in stationary bins with solar heated air  
13 p0019 A77-12411
- GRAPHITE**  
Silicon solar cells on zone-melted silicon/graphite substrates  
16 p0426 A77-45303  
Carbon oxidation catalyst mechanism study for fuel cells  
[PB-256420/1] 13 p0115 N77-13551  
Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- GRAPHITE-EPOXY COMPOSITE MATERIALS**  
Composites for large space structures  
[IAF PAPER 77-65] 16 p0507 A77-51416
- GRAPHS (CHARTS)**  
Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975  
14 p0154 A77-21850  
Thermal accumulators --- latent heat storage system design  
15 p0264 A77-31673  
Combustion research at Sandia Laboratories  
[SAND-76-8511] 15 p0377 N77-26253
- GRASSES**  
System study of fuels from grains and grasses  
[DS-3729-1] 16 p0519 N77-29318
- GRATINGS (SPECTRA)**  
On the theory and solar application of inductive grids --- wave diffraction modeling and far IR measurement  
16 p0419 A77-43556
- GRAVELS**  
Gravel and liquid storage system for solar thermal power plants  
16 p0491 A77-49101
- GRAVITATIONAL EFFECTS**  
Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station  
[GSS4ES/ [ATAA PAPER 77-511] 14 p0173 A77-23927  
Application of gravitational energy exchange to tracked urban transit systems  
14 p0200 A77-29468
- GRAVITY ANOMALIES**  
Gravity and ground magnetic surveys of the central mineral mountains, Utah, volume 6  
[PB-268423/1] 16 p0544 N77-32578
- GRAVITY GRADIENT SATELLITES**  
Gravitationally stabilized satellite solar power station in orbit  
14 p0196 A77-28421
- GREAT BASIN (US)**  
Geothermal studies in northern Nevada  
13 p0029 A77-12742
- GREAT BRITAIN**  
Windmills change direction --- British system utilizing offshore windmills and depleted North Sea fields  
13 p0060 A77-16620  
Energy policies of France, Britain, and Germany compared  
15 p0263 A77-31572
- GREAT PLAINS CORRIDOR (NORTH AMERICA)**  
Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions  
16 p0490 A77-49091
- GREENHOUSE EFFECT**  
Windowed versus windowless solar energy cavity receivers  
13 p0037 A77-12808
- GREENLAND**  
The Greenland hydropower as a source of electrolytic hydrogen  
15 p0285 A77-33416
- GRIDS**  
On the analysis and design of grid structures for p-n junction solar cells  
16 p0497 A77-49156
- GROOVES**  
Effects of one-sided heat input and removal on axially grooved heat pipe performance  
[ATAA PAPER 77-191] 14 p0135 A77-19887  
Re-entrant groove heat pipe --- computerized design for OAO applications  
[ATAA PAPER 77-773] 15 p0312 A77-37280

## Axially grooved heat pipes - 1976

- [ATAA PAPER 77-747] 15 p0324 A77-39512  
The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors  
16 p0502 A77-50214

## GROUND EFFECT (AERODYNAMICS)

- The spacing of wind turbines in large arrays  
16 p0416 A77-42893

## GROUND HANDLING

- Some early perspectives on ground requirements of liquid hydrogen air transports  
15 p0281 A77-33391  
Some early perspectives on ground requirements of liquid hydrogen air transports  
14 p0243 N77-21628

## GROUND OPERATIONAL SUPPORT SYSTEM

- Braxton isotope power system. Phase 1: (Ground demonstration system) Configuration Control Document (CCD)  
[TID-27252] 15 p0380 N77-26644

## GROUND STATIONS

- Satellite communications for off-shore oil operations using WESTAR  
13 p0053 A77-15130  
A small but important contribution to the German-American solar research programme 'Helios'  
15 p0323 A77-39125  
Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario  
16 p0489 A77-49085

## GROUND WATER

- Ground water as energy carrier  
15 p0302 A77-36347  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization  
[CONP-760222-P4] 14 p0248 N77-21675  
Contamination of groundwater by heavy metals from the land disposal of fly ash  
[COO-2727-4] 15 p0357 N77-23631
- GROUND WIND**  
Wind structure in strong winds below 150 m  
16 p0410 A77-42071

## GROWTH

- Proceedings of the Workshop on Analysis of 1974 and 1975 Power Growth  
[EPRI-EA-318-SR] 16 p0536 N77-31633

## GULF OF MEXICO

- Black magnetic spherule fallout in the eastern Gulf of Mexico  
13 p0052 A77-14890  
Geology and potential uses of the geopressure resources of the Gulf Coast  
[UCID-17163] 14 p0215 N77-18562  
Preliminary investigation. Nonproducing gas reserves onshore United States and in the Gulf of Mexico offshore state area, as reported in Federal Commission form 15  
[PB-263434/3] 15 p0355 N77-23597  
Proceedings of a workshop on environmental oceanography of the Gulf of Mexico  
[ORO-5017-1] 15 p0386 N77-26787  
Numerical simulation of United States Gulf Coast geothermal geopressured reservoirs  
16 p0545 N77-32585

## GULF STREAM

- Gulf Stream OTEC resource potential and environmental impact assessment overview --- Ocean Thermal Energy Conversion  
16 p0485 A77-49048

## GUNN DIODES

- High-efficiency and high-peak-power InP transferred-electron oscillators  
15 p0289 A77-34366

## H

## HABITABILITY

- Where do we locate the moon base --- considering polar regions as preferred lunar observatory sites  
16 p0504 A77-51023

## HALITES

- A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve  
[PB-255948/2] 13 p0105 N77-12500

## HALL EFFECT

- Electric power fluctuations in a MHD generator  
15 p0269 A77-32432
- Investigation of the Hall effect in the plasma of  
an inductive high-frequency discharge  
15 p0297 A77-36088
- The influence of finite electrode segmentation on  
electrical performances of the Faraday HD  
generator  
15 p0309 A77-36936
- Study of the maximum Hall voltages and  
interelectrode breakdown in the channel of an  
open-cycle MHD generator - A joint U.S.-U.S.S.R.  
experiment on the UO2 facility MHD generator  
15 p0329 A77-39554
- Coupled electrical and fluid calculations in the  
cross plane in linear MHD generators  
15 p0329 A77-39557
- Elimination of current concentration due to Hall  
effect by variable resistive electrodes  
16 p0418 A77-43119
- Effect of two-dimensional inhomogeneities on the  
properties of framed MHD channels  
16 p0428 A77-46088

## HALL GENERATORS

- Performance theory of diagonal conducting wall MHD  
generators  
13 p0001 A77-10202
- MHD power generation with fully ionized seed  
16 p0443 A77-48571

## HALOGEN COMPOUNDS

- Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process  
15 p0276 A77-33350

## HALOGENS

- Hydrogen-halogen energy storage system:  
Preliminary feasibility and economic assessment  
[BNL-22164]  
16 p0537 N77-31635

## HANDBOOKS

- Handbook of gasifiers and gas treatment systems  
[FE-1772-11]  
13 p0088 N77-10658
- Flat-plate solar collector handbook. A survey of  
principles, technical data and evaluation results  
[UCID-17C86]  
13 p0105 N77-12506
- Solar cell array design handbook, volume 1  
[NASA-CR-149364]  
13 p0118 N77-14193
- Solar cell array design handbook, volume 2  
[NASA-CR-149365]  
13 p0118 N77-14194
- EPA Van operational manual  
[PB-259177/4]  
14 p0233 N77-20608
- Site energy handbook. Volume 1: Methodology for  
energy survey and appraisal  
[ERDA-76-131/1]  
15 p0355 N77-23607
- The analysis of subsidence associated with  
geothermal development. Volume 1: Handbook  
[PB-263692/6]  
15 p0369 N77-24714
- Energy analysis handbook. CAC document 214  
[COO-2865-1]  
15 p0372 N77-25635
- Energy fact book, 1977 --- energy sources,  
technology, and conservation  
[AD-A038802]  
16 p0522 N77-29624
- Energy interrelationships. A handbook of tables  
and conversion factors for combining and  
comparing international energy data  
[PB-269034/5]  
16 p0559 N77-33675

## HARMONICS

- Element rating and coupling harmonics in a  
superconductive energy transfer system  
16 p0411 A77-42164

## HARTMANN FLOW

- Two-phase Hartmann flows in the MHD generator  
configuration  
[AD-A036452]  
16 p0518 N77-28948

## HAWAII

- Geothermal energy in Hawaii - Hydrothermal systems  
13 p0029 A77-12741
- Status report: Lawrence Livermore Laboratory wind  
energy studies  
[UCID-17157-1]  
14 p0221 N77-19588
- A coordinated exploration program for geothermal  
sources on the island of Hawaii  
[PB-261691/0]  
15 p0350 N77-22685
- Hawaii technology utilization experiment  
[UCID-17343]  
15 p0398 N77-28038

## HAZARDS

- Development status and environmental hazards of  
several candidate advanced energy systems  
16 p0452 A77-48776

- Small scale tests on control methods for some  
liquefied natural gas hazards  
[AD-A033522]  
15 p0341 N77-22293

## HEALTH PHYSICS

- Occupational radiation exposure at light water  
cooled power reactors, 1969-1975  
[PB-257054/7]  
13 p0125 N77-14740

## HEAT BALANCE

- Contribution of the heat carried by solar  
radiation to the thermal balance of a room  
during the cold season and its effect on  
domestic fuel consumption  
13 p0063 A77-17558

## HEAT EXCHANGERS

- Heat-pipe regenerator for gas turbine engine  
13 p0020 A77-12528
- Multipurpose insulation system for a radioisotope  
fueled Mini-Brayton Heat Source Assembly  
13 p0022 A77-12678
- Investigation of heat exchanger flow arrangement  
on performance and cost in a geothermal binary  
cycle  
13 p0029 A77-12746
- Direct contact heat exchangers for geothermal  
power plants  
13 p0029 A77-12747
- Fluidized bed heat exchangers for geothermal  
applications  
13 p0029 A77-12748
- Heat pipe heat exchanger design considerations  
13 p0031 A77-12765
- Analysis of parameters and characteristics of a  
bypass turbojet engine operating in a cycle with  
stepwise heat removal  
13 p0063 A77-17765
- Heat exchangers for the Ocean Thermal Energy Power  
Plant  
14 p0176 A77-24219
- Operational modes of solar heating and cooling  
systems  
14 p0180 A77-25899
- Optimal overall efficiency for a solar radiation  
collector utilizing a two fluid Rankine Cycle to  
generate electrical power  
14 p0182 A77-26056
- Design and costs of high temperature thermal  
storage devices using salts or alloys  
[ASME PAPER 76-WA/HT-34]  
14 p0187 A77-26481
- Heat transfer considerations of a nonconvecting  
solar pond heat exchanger  
[ASME PAPER 76-WA/SOL-4]  
14 p0188 A77-26509
- Automotive hydride tank design  
15 p0282 A77-33399
- Development of low-power gas turbines with  
regenerative heat exchangers at MTU. I  
15 p0289 A77-34122
- Application of heat pipes to ground storage of  
solar energy  
[AIAA PAPER 77-729]  
15 p0324 A77-39507
- Argon contamination associated with ceramic  
regenerative heat exchangers for closed cycle MHD  
15 p0326 A77-39536
- A heat capacitor for MHD electric power generation  
systems  
15 p0331 A77-39571
- Metal dusting corrosion in coal gasification  
environments  
15 p0337 A77-40042
- Perspectives on implementing OTEC power --- Ocean  
Thermal Energy Conversion  
[AIAA 77-1024]  
16 p0404 A77-41564
- A ceramic heat exchanger for exhaust fired gas  
turbine power cycles  
16 p0445 A77-48719
- The design of a sodium sulfate decahydrate heat  
exchanger for coolness storage --- in  
solar-powered air conditioning system  
16 p0450 A77-48760
- Molten salt thermal energy storage for utility  
peaking loads  
16 p0451 A77-48765
- Liquid fluidized bed heat exchanger - Horizontal  
configuration experiments and data correlations  
--- for geothermal applications  
16 p0455 A77-48799
- Studies of biofouling in ocean thermal energy  
conversion plants  
16 p0484 A77-49044

## HEAT FLUX

## SUBJECT INDEX

- Design of low-cost aluminum heat exchangers for OTEC plant-ships --- Ocean Thermal Energy Conversion 16 p0485 A77-49046
- Metallurgical evaluation of materials for geothermal power plant applications 16 p0499 A77-49700
- A design procedure for solar air heating systems 16 p0501 A77-50209
- Analysis of a heat pipe exchanger 13 p0112 A77-13355
- Comparative evaluation of solar heating alternatives [COO-2703-2] 13 p0129 A77-15498
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle [UCRL-78390] 14 p0221 A77-19587
- Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant [PB-261564/9] 15 p0349 A77-22684
- Regenerative vapor cycle with isobutane as working fluid [PB-262704/0] 15 p0356 A77-23622
- Ceramic heat pipe heat exchangers [LA-6514-MS] 15 p0361 A77-24431
- A numerical model to evaluate the behavior of a regenerative heat exchanger at high temperature --- for magnetohydrodynamic generator [TH-76-F-66] 15 p0377 A77-26439
- Preliminary failure modes, effects and criticality Analysis (FMECA) of the Erayton Isotope Power System (BIPS) ground demonstration system [TID-27301] 15 p0392 A77-27526
- Solar Collection Module Test Facility, instrumentation fluid loop number one [SAND-76-0425] 16 p0535 A77-31619
- HEAT FLUX**
- Optimal control of flow in low temperature solar heat collectors 13 p0019 A77-12409
- Geothermal flux through palagonitized tephra, Surtsey, Iceland - The Surtsey temperature-data-relay experiment via Landsat-1 13 p0048 A77-13648
- Irradiation field formation on the receiver of 'precise' and 'unprecise' solar concentrators 13 p0057 A77-16209
- A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- Circumferential variations of bore heat flux and outside surface temperature for a solar collector tube 16 p0429 A77-46426
- HEAT GENERATION**
- Retorting of single oil shale blocks with nitrogen and air 13 p0024 A77-12696
- Increase in the efficiency of heat and power systems using large artificial accumulators of heat 13 p0064 A77-17939
- Performance of two fixed-mirror solar concentrators for process heat 13 p0074 A77-19065
- Combined gas/steam cycle power and heat generating plants 14 p0155 A77-22023
- Energy assessment and possibilities of remote heat supply 15 p0338 A77-40350
- Feasibility study of an Integrated Energy/Utility System at the University of Florida 16 p0449 A77-48751
- Supercorroding alloys for generating heat and hydrogen gas 16 p0458 A77-48820
- Flywheel-heat engine power for an energy-economic personal vehicle [BNWL-2006] 14 p0214 A77-18448
- Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project [ERDA/NSF-00603/75/T1] 14 p0215 A77-18561
- Two-phase flow in geothermal energy sources [TID-27129] 14 p0250 A77-21689
- Energy conservation on campus. Volume 2: Case studies [PB-266212/0] 16 p0524 A77-29637
- HEAT MEASUREMENT**
- Results of some geothermal studies in Singhbhum thrust belt, India 13 p0013 A77-11499
- Calorimetry of large solar concentrators 13 p0038 A77-12814
- HEAT OF COMBUSTION**
- Fluidized-bed combustion of anthracite refuse 16 p0454 A77-48793
- HEAT OF DISSOCIATION**
- Feasibility of hydrogen production by direct water splitting at high temperature 14 p0240 A77-21606
- HEAT OF VAPORIZATION**
- Energy from humid air [AIAA PAPER 77-730] 15 p0311 A77-37253
- HEAT PIPES**
- Heat-pipe regenerator for gas turbine engine 13 p0020 A77-12528
- Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737
- The potential of the heat pipe in coal gasification processes 13 p0031 A77-12763
- Heat pipes for fluid-bed gasification of coal - Metallurgical condition of heat pipes after tests in process environment 13 p0031 A77-12764
- Heat pipe heat exchanger design considerations 13 p0031 A77-12765
- Cooling arrays of circuit cards using heat pipes and forced air diffusers 13 p0031 A77-12766
- VBP heat pipes for energy storage --- Vapor Bubble Pumping 13 p0032 A77-12767
- Heat pipe nuclear reactor for space power 13 p0036 A77-12797
- Economic optimization of the energy transport component of a large distributed solar power plant 13 p0037 A77-12807
- Study of the properties of heat pipes with liquid-metal heat-transfer agents in low-temperature regimes 13 p0046 A77-13243
- Investigation of the thermophysical characteristics of low-temperature heat pipes with metal-fiber wicks 13 p0050 A77-14321
- Structural heat conductivity of fiber metal wicks for heat pipes 13 p0050 A77-14326
- Investigation of gas-controlled heat pipes with reservoirs of constant and variable volume 13 p0050 A77-14327
- Gas release during long-term operation of heat pipes 13 p0050 A77-14328
- Heat pipe theory and practice --- Book 13 p0052 A77-14825
- Measurements of Sc I gf-values --- absorption spectroscopy using heat pipe oven 13 p0058 A77-16270
- Status of development and application of gas-stabilized heat-pipe radiators [DGLR PAPER 76-192] 13 p0060 A77-16557
- The analysis of the temperature regimes of the operation of a gas-regulated heat pipe 13 p0064 A77-17924
- A solar house with heat pipe collectors 13 p0070 A77-18598
- Effects of one-sided heat input and removal on axially grooved heat pipe performance [AIAA PAPER 77-191] 14 p0135 A77-19887
- Heat pipes in flat plate solar collectors [ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517
- Solar collectors - Technology and principles of operation 14 p0197 A77-28676
- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374
- Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe 15 p0306 A77-36708

Excess liquid in heat-pipe vapor spaces  
[AIAA PAPER 77-748] 15 p0311 A77-37261

Investigation of counterflow shear effects in heat pipes  
[AIAA PAPER 77-749] 15 p0311 A77-37262

Performance gravity-assisted heat pipes operated at small tilt angles  
[AIAA PAPER 77-750] 15 p0311 A77-37263

The heat pipe heat bridge and thermal controller  
[AIAA PAPER 77-751] 15 p0311 A77-37264

A zero g variable conductance heat pipe using bubble pump injection  
[AIAA PAPER 77-752] 15 p0311 A77-37265

Two-phase working fluids for the temperature range 100-350 C --- in heat pipes for solar applications  
[AIAA PAPER 77-753] 15 p0312 A77-37266

The multistage heat pipe radiator - An advancement in passive cooling technology  
[AIAA PAPER 77-760] 15 p0312 A77-37271

Re-entrant groove heat pipe --- computerized design for OAO applications  
[AIAA PAPER 77-773] 15 p0312 A77-37280

Controllability analysis for passively and actively controlled heat pipes  
[AIAA PAPER 77-776] 15 p0312 A77-37281

A precise satellite thermal control system using cascaded heat pipes  
[AIAA PAPER 77-777] 15 p0312 A77-37282

A structured surface for high performance evaporative heat transfer  
[AIAA PAPER 77-778] 15 p0312 A77-37283

Study of the characteristics of convective heat transfer in cylindrical solar energy receivers by solving the conjugate problem of heat exchange  
15 p0316 A77-37771

Investigation of the 'crisis' of heat and mass transfer in low-temperature wickless heat pipes  
15 p0316 A77-37927

Application of heat pipes to ground storage of solar energy  
[AIAA PAPER 77-729] 15 p0324 A77-39507

Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512

Development of a low temperature phase change material package --- for spacecraft thermal control  
[AIAA PAPER 77-762] 15 p0325 A77-39514

An analytical study of the maximal heat-carrying capacity of heat pipes  
16 p0411 A77-42260

A tubular evacuated solar collector utilizing a heat pipe as absorber  
16 p0417 A77-42961

Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem  
16 p0437 A77-47427

Thermal energy management techniques in spacecraft design and their potential for terrestrial applications  
16 p0439 A77-47969

Heat pipes for hostile environments in energy conservation applications  
16 p0450 A77-48758

Demand sensitive energy storage in molten salts  
16 p0491 A77-49102

Investigation of the effective heat conductivity of metal-fiber wicks for low-temperature heat pipes  
16 p0500 A77-49988

An investigation of condensation heat transfer in a closed tube containing a soluble noncondensable gas  
[NASA-CR-149095] 13 p0085 N77-10465

Test program for transmitter experiment package and heat pipe system for the communications technology satellite  
[NASA-TN-X-3455] 13 p0095 N77-11268

Investigation of performance limits in axial groove heat pipes  
[NASA-CR-137912] 13 p0095 N77-11340

Heat pipe materials compatibility  
[NASA-CR-135069] 13 p0103 N77-12182

Analysis of a heat pipe exchanger  
13 p0112 N77-13355

Flight data analysis and further development of variable-conductance heat pipes  
[NASA-CR-137953] 13 p0118 N77-14374

Computer program grade 2 for the design and analysis of heat-pipe wicks  
[NASA-CR-137954] 13 p0118 N77-14375

Heat pipes, volume 2 --- conference proceedings, Bologna, 31 Mar. - 2 Apr. 1976  
[ESA-SP-112-VOL-2] 13 p0119 N77-14378

Extended cryogenic performance of Lobar Wick heat pipe/radiator  
13 p0119 N77-14379

Operation peculiarities of low temperature heat pipes with crimped capillary structure  
13 p0119 N77-14380

Heat pipes for the temperature range from 200 to 600 C --- noting sulfur with iodine additive as working fluid  
13 p0119 N77-14381

Some features of start-up of alkali metal heat pipes  
13 p0119 N77-14383

Investigations of nonsteady-state processes at cryogenic heat pipe operation --- filled with ammonia and Freon-22  
13 p0119 N77-14384

Transfer function analysis of heat pipes  
13 p0119 N77-14385

Wetting and surface properties of refrigerants to be used in heat pipes --- surface tension and wall contact angles  
13 p0119 N77-14386

Heat pipes with a non-condensable gas and their application in nuclear apparatus and instruments  
13 p0120 N77-14387

Heat pipes for the trans-Alaska pipeline  
13 p0120 N77-14388

The International Heat Pipe Experiment --- Black Brant sounding rocket payload zero gravity experiment  
13 p0120 N77-14389

Development of space applications of heat pipes at Aerospatiale  
13 p0120 N77-14390

Heat pipe and space radiator developments  
13 p0120 N77-14391

Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on)  
[NASA-CR-150152] 13 p0127 N77-15347

Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
14 p0240 N77-21608

An investigation of electrohydrodynamic heat pipes  
[NASA-CR-151977] 15 p0342 N77-22422

Design considerations for capillary heat pipes at cryogenic temperatures  
[ORNL-MIT-28] 15 p0361 N77-24430

Ceramic heat pipe heat exchangers  
[LA-6514-MS] 15 p0361 N77-24431

Heat transportation by hot water pipe-lines at 90 deg C  
[AD-A038301] 16 p0512 N77-28453

Flexible cryogenic heat pipe development program  
[NASA-CR-152027] 16 p0520 N77-29451

Gas-interface studies in large horizontal heat pipes  
[LA-6646-MS] 16 p0520 N77-29455

Use of heat pipes in electronic hardware  
16 p0526 N77-30293

Development of a jet pump-assisted arterial heat pipe  
[NASA-CR-152015] 16 p0527 N77-30415

Heat-pipe bismuth laser; examination of laser action at 4722 A in bismuth vapor  
[AD-A039568] 16 p0533 N77-31495

Demonstration testing of a Vuilleumier cryocooler with an integral  
[AD-A042786] 16 p0547 N77-32599

Thermal energy storage demonstration unit for Vuilleumier cryogenic cooler  
[AD-A040895] 16 p0553 N77-33613

**HEAT PUMPS**

Some features of the operation of a solar installation acting as a low-temperature source of heat for a heat pump  
13 p0015 A77-11924

Geothermal powered heat pumps to produce process heat  
13 p0030 A77-12754

A unique Rankine-cycle heat pump system  
13 p0036 A77-12799

Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800

- Energy and environmental considerations in extending heat pump applications 13 p0062 A77-17058
- Solar space heating and cooling with Bi-heat source heat pump and hot water supply system 14 p0158 A77-22643
- Operational report on an integrated solar-assisted optimized heat pump system 14 p0171 A77-23658
- Possible applications of geothermal energy in France 14 p0175 A77-24208
- Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes 14 p0177 A77-24571
- The proper use of thermal storages for a solar assisted heat pump heating system [ASME PAPER 76-WA/HT-76] 14 p0187 A77-26492
- Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps [ASME PAPER 76-WA/SOL-23] 14 p0190 A77-26528
- Gas-fired heat pumps - An emerging technology 14 p0195 A77-27891
- Heat pumps in solar installations 15 p0337 A77-39987
- The unitary heat pump industry - 25 years of progress 16 p0408 A77-41822
- The annual cycle energy system - A hybrid heat pump cycle 16 p0408 A77-41823
- 10 design principles for air-to-air heat pumps 16 p0408 A77-41824
- Prefabricated houses with an indoor swimming pool heated by a heat pump 16 p0421 A77-44448
- The heat pump - An approach for saving energy 16 p0421 A77-44450
- ERDA fuel cell programs 16 p0447 A77-48734
- Development of the High Seasonal Performance Factor Gas Heat Pump --- for space heating 16 p0448 A77-48744
- Development of a Stirling engine powered heat activated heat pump 16 p0448 A77-48745
- Free-piston heat pumps --- using various thermodynamic cycles 16 p0449 A77-48748
- Experimental evaluation of a solar/wind-powered space heating and hot water heating system in the Pacific Northwest 16 p0462 A77-48849
- A hybrid solar-assisted heat pump system for residential applications 16 p0477 A77-48981
- Simulation study of solar heat pump systems 16 p0477 A77-48982
- Solar assisted heat pump air conditioning system 16 p0477 A77-48985
- Operational analysis of a solar optimized heat pump 16 p0478 A77-48986
- International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings 16 p0500 A77-49753
- Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153
- Commercial building unitary heat pump system with solar heating [PB-255488/9] 13 p0099 A77-11551
- Evaluation of the air-to-air heat pump for residential space conditioning [PB-255652/0] 13 p0108 A77-12545
- Solar assisted heat pumps: A possible wave of the future [NASA-CR-2771] 13 p0121 A77-14584
- Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle 13 p0124 A77-14607
- Comparative evaluation of solar heating alternatives [COO-2703-2] 13 p0129 A77-15498
- Solar assisted heat pump demonstration project, phase 1 [PB-259289/7] 14 p0217 A77-18589
- Development of the ice-maker heat pump [CONF-760618-2] 14 p0223 A77-19624
- Experimental results for a heat pump system with thermal storage [COO-2704-3] 14 p0250 A77-21697
- Application of the ice-maker heat pump to an annual cycle energy system [CONF-761107-13] 15 p0382 A77-26659
- Heat pumps: Substitutes for outmoded fossil-fueled systems [PB-266218/7] 16 p0524 A77-29638
- Demonstration of building heating with a heat pump using thermal effluent [AD-A041024] 16 p0530 A77-30631
- Assessment of a single-family residence solar heating system in a suburban development setting. Project Phoenix [PB-263192/7] 16 p0530 A77-30632
- Magnetic heat pumping [NASA-CASE-LEW-12508-2] 16 p0543 A77-32435
- HEAT RADIATORS
- Use of transparent heat reflecting coatings in solar energy converters 15 p0285 A77-33430
- The multistage heat pipe radiator - An advancement in passive cooling technology [AIAA PAPER 77-760] 15 p0312 A77-37271
- Utilization of transparent heat-reflecting coatings in solar-energy converters 16 p0426 A77-45543
- Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on) [NASA-CR-150152] 13 p0127 A77-15347
- Composite material structures for thermophotovoltaic conversion radiator [AD-A026859] 13 p0132 A77-15519
- HEAT RESISTANT ALLOYS
- Superalloys for advanced energy systems 13 p0061 A77-16824
- Superalloys - Their use and requirements in advanced energy systems 14 p0196 A77-28322
- Laboratory investigation of high temperature alloy failure mechanisms 15 p0271 A77-32608
- HEAT SINKS
- Relationship between heat source temperature, heat sink temperature and coefficient of performance for solar-powered absorption air conditioners 14 p0168 A77-23446
- Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 A77-20616
- HEAT SOURCES
- Electricity and heat production - Energy efficiency versus cost efficiency 13 p0011 A77-11338
- Some features of the operation of a solar installation acting as a low-temperature source of heat for a heat pump 13 p0015 A77-11924
- Multipurpose insulation system for a radioisotope fueled Mini-Brayton Heat Source Assembly 13 p0022 A77-12678
- Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770
- Isotope heat source for dynamic power systems 13 p0036 A77-12796
- Development of a small radioisotopic heat source 13 p0042 A77-12852
- Spherical radioisotope thermoelectric generators - An approach to high specific power devices 13 p0042 A77-12857
- Geothermal sources and their utilization 13 p0055 A77-15803
- Application of solar energy in the high-temperature range 13 p0063 A77-17636
- Relationship between heat source temperature, heat sink temperature and coefficient of performance for solar-powered absorption air conditioners 14 p0168 A77-23446
- Water splitting - A progress report --- hydrogen production using high temperature gas-cooled reactor 15 p0274 A77-33330



- Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 15 p0274 A77-33335
- Hydrogen production from coal using a nuclear heat source 15 p0275 A77-33339
- The outlook for more efficient fuel utilization in generation of process heat 15 p0294 A77-35400
- 600 kW Organic Rankine Cycle Waste Heat Power Conversion System 16 p0459 A77-48829
- Analysis of ceramic materials for impact members in isotopic heat sources [BMI-X-670] 14 p0210 A77-17246
- Technical and economic aspects of potential US district heating systems [BNL-21287] 14 p0232 A77-20594
- Preliminary failure modes, effects and criticality analysis (FMECA) of the Brayton Isotope Power System (BIPS) ground demonstration system [TID-27301] 15 p0392 A77-27526
- Heat source component development program [BMI-X-676] 16 p0536 A77-31632
- HEAT STORAGE**
- Thermal energy storage applied to residential heating systems 13 p0027 A77-12729
- Storage in cell of off-peak thermal energy from large power stations 13 p0027 A77-12730
- Thermal energy storage for solar power plants 13 p0027 A77-12731
- Thermal energy storage considerations for solar-thermal power generation 13 p0027 A77-12732
- Industrial energy conservation through integration of thermal energy storage into process energy dynamics 13 p0028 A77-12733
- Thermochemical energy storage systems 13 p0028 A77-12738
- An evaluation of the use of metal hydrides for solar thermal energy storage 13 p0028 A77-12739
- HYCROS - A solar heating, cooling and energy conversion system based on metal hydrides 13 p0029 A77-12740
- VBP heat pipes for energy storage --- Vapor Bubble Pumping 13 p0032 A77-12767
- Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data 13 p0039 A77-12824
- Thermal energy storage for heating and air conditioning 13 p0057 A77-16206
- Transient behavior of solid sensible heat thermal storage units for solar energy systems 13 p0057 A77-16208
- A central solar energy utilization system 13 p0057 A77-16210
- Increase in the efficiency of heat and power systems using large artificial accumulators of heat 13 p0064 A77-17939
- Parametric studies of the thermal trap flat plate collector 13 p0068 A77-18443
- An inflatable solar concentrator for a high temperature storage system 13 p0074 A77-19064
- Design and performance of thermal storage water tank 13 p0075 A77-19079
- Problems relating to heat storage --- at solar thermal power plant 14 p0152 A77-21826
- Utilization of solar radiation in large solar power plants with hydraulic storage 14 p0152 A77-21827
- Energy storage in the form of latent heat 14 p0157 A77-22350
- Operational report on an integrated solar-assisted optimized heat pump system 14 p0171 A77-23658
- Storage tanks - A numerical experiment --- for solar heating 14 p0180 A77-25898
- Optimal overall efficiency for a solar radiation collector utilizing a two fluid Rankine Cycle to generate electrical power 14 p0184 A77-26056
- Design and costs of high temperature thermal storage devices using salts or alloys [ASME PAPER 76-WA/HT-34] 14 p0187 A77-26481
- Solar heating thermal storage feasibility [ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483
- A pressurized liquid concept for solar-thermal energy storage for the 24-hour continuous operation of an energy conversion system [ASME PAPER 76-WA/HT-38] 14 p0187 A77-26484
- A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- Description of thermal storage sub-system designs for ERDA's 10-MWe Solar Central Receiver Pilot Plant [ASME PAPER 76-WA/HT-68] 14 p0187 A77-26491
- The proper use of thermal storages for a solar assisted heat pump heating system [ASME PAPER 76-WA/HT-76] 14 p0187 A77-26492
- Collectors, pipelines, and heat storage units made of plastics 14 p0202 A77-29567
- Physical, chemical, and technological principles of latent heat storage 14 p0203 A77-29571
- Thermal accumulators --- latent heat storage system design 15 p0264 A77-31673
- Freeze protection for solar collectors 15 p0303 A77-36350
- Solar collection systems - The rationale 15 p0304 A77-36426
- Thermal storage - A sleeping giant 15 p0304 A77-36427
- Sandia studies for ERDA central receiver thermal electric power project --- Solar generating system 15 p0318 A77-38208
- Solar energy as contribution to the energy budget - Problems of storage 15 p0336 A77-39986
- Thermal storage for electric utilities [AIAA 77-1009] 16 p0403 A77-41556
- Integration of solar generation into electric utility systems [AIAA 77-1020] 16 p0404 A77-41562
- The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- Use of adsorbent beds for energy storage in drying of heating systems 16 p0405 A77-41577
- Simulation analysis of passive solar heated buildings - Preliminary results 16 p0406 A77-41582
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587
- Thermal storage - It saves and saves and saves --- energy conservation 16 p0415 A77-42741
- Study of thermal performance of solar heating systems with storage and auxiliary heaters 16 p0417 A77-42957
- Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern France 16 p0417 A77-42963
- Fundamental studies on heat storage of solar energy 16 p0423 A77-44490
- High temperature thermal energy storage system, Na2SO4 + SO3 reversibly yields Na2SO7 16 p0450 A77-48764
- Molten salt thermal energy storage for utility peaking loads 16 p0451 A77-48765
- Investigation of metal fluoride thermal energy storage materials 16 p0451 A77-48767
- Safety considerations for high temperature thermal energy storage in fluoride salts 16 p0451 A77-48768
- Large-scale thermal storage in rock - Construction, utilization, and economics 16 p0451 A77-48769

- Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- Thermal energy storage 16 p0461 A77-48841
- Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant 16 p0461 A77-48842
- Design of sodium-cooled, central receiver solar power plant 16 p0461 A77-48843
- Experimental evaluation of a solar/wind-powered space heating and hot water heating system in the Pacific Northwest 16 p0462 A77-48849
- The current technology for solar heating and cooling 16 p0470 A77-48919
- ERDA/USDA Agricultural Solar Thermal Energy Program 16 p0470 A77-48921
- ERDA Solar Thermal Energy Program for industrial process heat 16 p0470 A77-48922
- The climatology of available solar energy for Canada 16 p0471 A77-48924
- Comparative performance of solar heating with air and liquid systems 16 p0475 A77-48967
- A design procedure for solar air heating systems 16 p0480 A77-49006
- Minimum cost sizing of solar heating systems 16 p0480 A77-49010
- Solar energy for process heat 16 p0481 A77-49020
- Smith multimodule solar-electric plant 16 p0482 A77-49023
- Solar pond stability experiments 16 p0482 A77-49028
- Solar industrial steam 16 p0482 A77-49029
- Central receiver solar thermal power 16 p0484 A77-49037
- High temperature thermal energy storage 16 p0491 A77-49099
- Chemical methods of storing thermal energy 16 p0491 A77-49100
- Gravel and liquid storage system for solar thermal power plants 16 p0491 A77-49101
- Demand sensitive energy storage in molten salts 16 p0491 A77-49102
- Inorganic phase change materials for energy storage in solar thermal program 16 p0492 A77-49103
- High-temperature energy storage in native rocks 16 p0492 A77-49104
- Thermal storage in metals 16 p0492 A77-49105
- Thermal energy storage using large hollow steel ingots 16 p0492 A77-49106
- Thermal energy storage by the sulfuric acid-water system 16 p0492 A77-49108
- Storage of solar energy by inorganic oxide/hydroxides 16 p0492 A77-49109
- Reversible oxidation of metal oxides for thermal energy storage 16 p0492 A77-49110
- Thermal energy storage with saturated aqueous solutions 16 p0493 A77-49111
- Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- An immiscible fluid - Heat of fusion energy storage system 16 p0493 A77-49113
- Reinforced pillow solar water heater 16 p0493 A77-49114
- Description of Provident House, King City, Ontario 16 p0495 A77-49133
- Thermal energy storage and transportation 16 p0497 A77-49153
- A design procedure for solar air heating systems 16 p0501 A77-50209
- Two component thermal energy storage material [PB-252592/1] 13 p0090 A77-10675
- Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings [PB-254665/3] 13 p0091 A77-10689
- Outdoor performance results for NBS Round Robin collector no. 1 [NASA-TN-X-73547] 13 p0106 A77-12520
- Temperature distribution of a hot water storage tank in a simulated solar heating and cooling system [NASA-TN-X-73549] 13 p0106 A77-12521
- Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 A77-20616
- Experimental results for a heat pump system with thermal storage [COO-2704-3] 14 p0250 A77-21697
- Role of the heat storage well future U.S. energy systems [PB-263480/6] 15 p0367 A77-24634
- United States special format report: Report of the Phoenix Corporation, City of Colorado Springs Solar Heating Project [SE-4578-76/1] 15 p0373 A77-25647
- Hydration-dehydration cycling of  $\text{MgO} \cdot \text{Mg}(\text{OH})_2$  for application to solar heat storage systems [AI-ERDA-13178] 15 p0381 A77-26654
- Experimental test of gas heat transfer system for hydroxide heat storage [AI-ERDA-13176] 15 p0381 A77-26655
- Simulation study of several solar heating systems with offpeak auxiliary [CONF-760842-13] 15 p0393 A77-27534
- Low-temperature thermal energy storage [ORNL-TN-5795] 16 p0536 A77-31631
- Transpiration heat transfer in thermal energy storage devices [PB-267281/4] 16 p0554 A77-33616
- Advanced Thermal Energy Storage (TES) systems [EPRI-EH-256-SY] 16 p0555 A77-33622
- Consumer thermal energy storage costs for residential hot water, space heating and space cooling systems [ANL-K-76-3364-1] 16 p0556 A77-33631
- Strategies for commercializing customer thermal-energy storage [ANL-ES-55] 16 p0557 A77-33649
- HEAT TRANSFER**
- Heat transfer - A review of 1975 literature 13 p0002 A77-10615
- Performance analysis of a cylindrical parabolic focusing collector and comparison with experimental results 13 p0019 A77-12410
- Central station solar electric power using liquid metal heat transport 13 p0037 A77-12806
- Future energy production systems: Heat and mass transfer processes. Volume 1 --- Book 13 p0056 A77-16201
- Heat and mass transfer for solar energy utilization 13 p0057 A77-16205
- Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide 13 p0058 A77-16213
- A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems 13 p0058 A77-16306
- Heat transfer problems associated with laser fusion 13 p0068 A77-18441
- Temperature optimization for power production of infinite heat transfer solar absorbers 13 p0073 A77-19055
- Slag interaction phenomena on MHD generator electrodes [AIAA PAPER 77-109] 14 p0135 A77-19833
- Effects of one-sided heat input and removal on axially grooved heat pipe performance [AIAA PAPER 77-191] 14 p0135 A77-19887
- Future energy production systems: Heat and mass transfer processes. Volume 2 --- Book 14 p0174 A77-24201
- Problems of heat and mass transfer in geothermal energetics 14 p0174 A77-24202

- Some aspects of heat and mass transfer in geothermal wells 14 p0175 A77-24209
- Heat and mass transfer problems associated with alternative energy production 14 p0176 A77-24216
- Solar powered absorption cycle simulation using real and stochastic weather data [ASME PAPER 76-WA/SCL-6] 14 p0188 A77-26511
- Heat transfer problems in flat plate collectors 14 p0202 A77-29570
- Design application of the Bottel-Whillier-Bliss equation --- for flat-plate solar collector heat testing 15 p0255 A77-30309
- Solar-heated-air receivers --- of solar/gas turbine electrical generation plant design 15 p0255 A77-30312
- Optimum solar collector operation for maximizing cycle work output 15 p0255 A77-30313
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 15 p0278 A77-33363
- The behavior of iron titanium hydride test beds - Long-term effects, heat transfer and modeling 15 p0280 A77-33386
- Two-phase working fluids for the temperature range 100-350 C --- in heat pipes for solar applications [AIAA PAPER 77-753] 15 p0312 A77-37266
- Re-entrant groove heat pipe --- computerized design for OAO applications [AIAA PAPER 77-773] 15 p0312 A77-37280
- A structured surface for high performance evaporative heat transfer [AIAA PAPER 77-778] 15 p0312 A77-37283
- Investigation of the 'crisis' of heat and mass transfer in low-temperature wickless heat pipes 15 p0316 A77-37927
- Heat and mass transfer analysis of Bacon-type hydrogen-oxygen fuel cells - The volume average velocity 15 p0321 A77-38531
- Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361
- An analytical study of the maximal heat-carrying capacity of heat pipes 16 p0411 A77-42260
- Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26] 16 p0432 A77-46909
- Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations --- for geothermal applications 16 p0455 A77-48799
- Heat mirror - A practical alternative to the selective absorber 16 p0488 A77-49075
- Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- Heat transfer analysis of a flat-plate solar energy collector 16 p0501 A77-50207
- Fundamental research on heat transfer performances of solar focusing and tracking collector 16 p0502 A77-50223
- An investigation of condensation heat transfer in a closed tube containing a soluble noncondensable gas [NASA-CR-149095] 13 p0685 A77-10465
- Selected aspects of waste heat management [PB-254401/3] 13 p0109 A77-12568
- The structure of building specifications [PB-257581/9] 13 p0132 A77-15524
- Petrology and geochemistry of hydrothermal alteration in borehole Mesa 6-2, East Mesa geothermal area, Imperial Valley, California [PB-258871/3] 14 p0215 A77-18541
- Ocean thermal energy conversion opportunities [BNWL-SA-5808] 14 p0217 A77-18581
- Storage of thermal energy in molten salts and metals [NASA-TT-F-17412] 14 p0220 A77-19574
- Extracting energy from hydraulically-fractured geothermal reservoirs [LA-UR-76-848] 14 p0221 A77-19598
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 14 p0235 A77-21597
- The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling 14 p0242 A77-21621
- Regenerative vapor cycle with isobutane as working fluid [PB-262704/0] 15 p0356 A77-23622
- Design considerations for capillary heat pipes at cryogenic temperatures [ORNL-MIT-28] 15 p0361 A77-24430
- Mathematical modelling of single-phase nonisothermal fluid flow through porous media [PB-262884/0] 15 p0362 A77-24577
- Evaluation of an all-glass, evacuated, tubular, non-focusing, non-tracking solar collector array [TID-27192] 15 p0364 A77-24600
- Experimental test of gas heat transfer system for hydroxide heat storage [AI-ERDA-13176] 15 p0381 A77-26655
- Survey of technology for storage of thermal energy in heat transfer salt [ORNL-TN-5682] 15 p0392 A77-27513
- Computer simulation of geothermal reservoirs [PB-265104/0] 15 p0395 A77-27564
- Some thoughts on optimizing long-distance heat transport systems and their storage facilities [AD-A038253] 16 p0516 A77-28608
- Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 A77-28609
- Internal heat transfer experiments in a simulated OTEC evaporator tube [APL/JHU/AEO-76-066] 16 p0521 A77-29611
- Thermal gradient and heat flow drilling, volume 5 [PB-268422/3] 16 p0544 A77-32577
- Demonstration testing of a Vuilleumier cryocooler with an integral [AD-A042786] 16 p0547 A77-32599
- Transpiration heat transfer in thermal energy storage devices [PB-267281/4] 16 p0554 A77-33616
- HEAT TRANSFER COEFFICIENTS**
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle 13 p0029 A77-12746
- Direct contact heat exchangers for geothermal power plants 13 p0029 A77-12747
- Metal hydrides of improved heat transfer characteristics 13 p0033 A77-12775
- Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324
- The analysis of the temperature regimes of the operation of a gas-regulated heat pipe 13 p0064 A77-17924
- Focusing collectors of solar radiation 14 p0150 A77-21808
- Thermal energy of oceans 14 p0153 A77-21833
- Free thermal convection in geothermal fields - Physical understanding and mathematical modeling 14 p0174 A77-24204
- Gas-solid heat transfer coefficients in beds of crushed oil shale 14 p0196 A77-28472
- Pressurized fluidized-bed coal combustion 16 p0454 A77-48788
- A heat transfer criterion on the geometric configuration of flat solar water heaters 16 p0472 A77-48944
- HEAT TRANSMISSION**
- Heat transport in geothermal systems 14 p0174 A77-24203
- The heat pipe heat bridge and thermal controller [AIAA PAPER 77-751] 15 p0311 A77-37264
- Geothermal R and D project report [ANCR-1283] 13 p0124 A77-14605
- Technical prospects for commercial and residential distribution and utilization of hydrogen 14 p0245 A77-21642
- HEAT TREATMENT**
- Reactivity heat-treated coals in hydrogen --- for synthetic methane production 14 p0198 A77-28777

- Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750
- Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis 15 p0298 A77-36254
- Thermal processing of municipal solid waste for resource and energy recovery --- Book 16 p0438 A77-47951
- Heat treatment of refuse for increasing anaerobic biodegradability [PB-252924/6] 13 p0101 N77-11577
- HEATERS**
- An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207
- Reinforced pillow solar water heater 16 p0493 A77-49114
- HEATING**
- The wind and its effect on the heating requirements 13 p0009 A77-11266
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Semiannual Meeting, Dallas, Tex., February 1-5, 1976, Proceedings 14 p0167 A77-23438
- Combined heat and electricity generation as a means for saving primary energy 16 p0505 A77-51155
- Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638
- Evaluation of the air-to-air heat pump for residential space conditioning [PB-255652/0] 13 p0108 N77-12545
- Feasibility of heating domestic hot water for apartments with solar energy [AD-A028418] 14 p0209 N77-16461
- Economic study of solar total energy [SAND-76-5291] 14 p0216 N77-18574
- Application of chemical dehumidification system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana [NASA-CR-149888] 14 p0228 N77-20560
- Proceedings of an EPRI Workshop on Technologies for Conservation and Efficient Use of Electric Energy. Volume 1: Overview [PB-261465/1] 14 p0230 N77-20577
- Technical and economic feasibility of US district heating systems using waste heat from fusion reactors [BNL-50516] 14 p0232 N77-20606
- Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 1: Solar heating and cooling of buildings [PB-260594/7] 14 p0252 N77-21721
- Thermal energy storage for building heating and cooling applications [ORNL-TM-5700] 15 p0344 N77-22617
- Heating oils, 1976 [BERC/PES-76/4] 15 p0344 N77-22626
- Annual cycle energy system: Initial investigations [ORNL-TM-5525] 15 p0364 N77-24599
- WATSON: A solar heating simulation and economic evaluation program [NP-213C7] 15 p0364 N77-24603
- Progress report on the performance of three Australian solar hot water systems [SES-8] 15 p0364 N77-24604
- United States special format report: Performance of the Sohio Solar Water Heating System using large area plastic collectors (Grants, New Mexico) [SAR/1038-76/1] 15 p0365 N77-24606
- Determining the technical and economic feasibility of utilizing solar energy for heating buildings in Canada [NP-213C8] 15 p0365 N77-24611
- Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany [ANL-ES-50] 15 p0365 N77-24612
- Predicting the performance of solar energy systems [AD-A035608] 15 p0373 N77-25660
- Solar heating and cooling technical data and systems analysis [NASA-CR-150305] 15 p0378 N77-26611
- Application of the ice-maker heat pump to an annual cycle energy system [CONF-761107-13] 15 p0382 N77-26659
- Design procedure for solar air heating systems [CONF-760842-14] 16 p0514 N77-28589
- Savings in energy consumption by residential heat pumps: the effects of lower indoor temperatures and of night setback [ORNL-CCN-4] 16 p0529 N77-30628
- Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems [PB-267832/4] 16 p0554 N77-33618
- Solar energy: Policy and prospects [PB-267986/8] 16 p0554 N77-33620
- Strategies for commercializing customer thermal-energy storage [ANL-ES-55] 16 p0557 N77-33649
- HEATING EQUIPMENT**
- R&M - Today's heating and cooling vs. solar energy 13 p0002 A77-10482
- The assurance of the heat supply with respect to the primary energy use in the case of heating and air conditioning installations 13 p0009 A77-11270
- The utility of waters from the high-temperature areas in Iceland for space heating as determined by their chemical composition 13 p0012 A77-11496
- Energy in the household - Comparison of heating costs and prognosis concerning the consumption of energy until 1985 13 p0015 A77-12059
- The solar water heater industry in South Florida - History and projections 13 p0018 A77-12403
- Thermal evaluation of a house using a movable-insulation heating and cooling system 13 p0019 A77-12407
- A method of testing for rating solar collectors based on thermal performance 13 p0019 A77-12408
- Grain drying in stationary bins with solar heated air 13 p0019 A77-12411
- A forced circulation system for solar water heating 13 p0019 A77-12413
- Energy conservation potential of Modular Integrator Utility Systems /MIUS/ 13 p0026 A77-12724
- Thermal energy storage applied to residential heating systems 13 p0027 A77-12729
- Space heating systems new and conventional in the Northwest with emphasis on alternate energy adaptations 13 p0028 A77-12736
- Direct applications of geothermal energy 13 p0030 A77-12755
- The utilization and economics of low temperature geothermal water for space heating 13 p0030 A77-12756
- Practical aspects of solar heating - A review of materials use in solar heating applications 13 p0049 A77-13743
- Calculation of the radiation entering a 'hot box' type solar set-up 13 p0051 A77-14581
- Utilization of solar power - A new departure 13 p0053 A77-15049
- Energy and environmental considerations in extending heat pump applications 13 p0062 A77-17058
- Homeowner's guide to solar heating and cooling --- Book 13 p0062 A77-17525
- Development of a mobile solar testing and recording /STAR/ system --- trailer for domestic hot water system testing 13 p0074 A77-19047
- Stationary solar concentrators for industrial heating and cooling 13 p0074 A77-19069
- Survey of absorption refrigeration systems 13 p0078 A77-19105
- Annular-flow solar heater collector tubes [AIAA PAPER 77-190] 14 p0135 A77-19886
- Principles of atomic central heating 14 p0136 A77-20102

- Progress on the testing of refractories for directly-fired MHD air heater service 14 p0142 A77-21254
- Solar retrofit in a large institutional building - An economic analysis 14 p0176 A77-24500
- A self-contained solar powered tracking device [ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477
- The MBB solar houses - Design, operation, and experience 14 p0197 A77-28678
- Physical, chemical, and technological principles of latent heat storage 14 p0203 A77-29571
- Principles and systems for utilization of solar energy in heating and preparation of hot water 15 p0255 A77-30257
- Calculation of long term solar collector heating system performance 15 p0255 A77-30311
- Design and performance studies on a solar room heater 15 p0255 A77-30314
- Dimensioning of the solar heating system in the Zero Energy House in Denmark 15 p0256 A77-30319
- The law for saving energy and its significance for energy policies 15 p0261 A77-31372
- Optimal tap water heating 15 p0261 A77-31375
- Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility 15 p0271 A77-32800
- Calculation of radiation entering 'hot box' solar unit 15 p0291 A77-34975
- District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164
- 80 per cent of the heat requirements satisfied by the sun --- in solar house 15 p0304 A77-36450
- Corrosion of potential MHD preheater materials in liquid slag and slag-lead 15 p0327 A77-39541
- Technical and economic aspects of industrial power-heat coupling. I 15 p0334 A77-39674
- Calculation and optimization of solar-energy systems which provide hot water 15 p0337 A77-39988
- The BEC Solarwatt system --- for domestic hot water supply 15 p0337 A77-39989
- Possibilities and limitations concerning the economy of solar heating systems 15 p0337 A77-39990
- Aerospace and HVAC&R: Spinoff '77 - Reaping the dividends --- Heating, Ventilation, Air Conditioning, and Refrigeration 16 p0427 A77-45918
- Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26] 16 p0432 A77-46909
- Light commercial Brayton/Bankine space conditioning system 16 p0445 A77-48716
- Geothermal space heating - The symbiosis with fossil fuel 16 p0455 A77-48797
- Solar retrofit of a home in Granton, Ontario 16 p0479 A77-48995
- A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families 16 p0479 A77-48998
- A design procedure for solar air heating systems 16 p0480 A77-49006
- Improved, inexpensive solar collectors for agricultural requirements 16 p0488 A77-49077
- Design and performance of an air collector for industrial crop dehydration 16 p0488 A77-49078
- An experimental investigation with artificial sunlight of a solar hot-water heater 16 p0498 A77-49163
- Investigation of the mechanism of cleaning heating surfaces by the pulsation method [BLL-M-25448-(5828.4F)] 13 p0112 N77-13245
- Development of the ice-maker heat pump [CONF-760618-2] 14 p0223 N77-19624
- An economic and performance design study of solar preheaters for domestic hot water heaters in North Carolina [NASA-CR-2813] 14 p0228 N77-20559
- Operation of military field heating equipment using solid fuels [AD-A037121] 15 p0388 N77-27152
- Solar house heating system using reflective pyramid optical condensing system [COC-2769-4] 16 p0522 N77-29619
- Developing and testing of a wastewater recycler and heater [NASA-CR-154846] 16 p0531 N77-31040
- Further development of the compressed-film floating-deck solar water heater [PB-268514/7] 16 p0547 N77-32603
- Consumer thermal energy storage costs for residential hot water, space heating and space cooling systems [ANL-K-76-3364-1] 16 p0556 N77-33631
- HEAVY WATER**  
Peak power and heavy water production from electrolytic H<sub>2</sub> and O<sub>2</sub> using CANDU reactors 15 p0274 A77-33332
- HELICAL FLOW**  
Helical-rotor expander applications for geothermal energy conversion [UCRL-52043] 14 p0221 N77-19586
- HELICAL WINDINGS**  
Studies of helical conductor models for superconducting ac power transmission [BNL-21784] 14 p0236 N77-21332
- HELICOPTER DESIGN**  
Composite technology - The boom is under way --- rotorcraft materials 15 p0287 A77-33616
- Advanced helicopter structural design investigation. Volume 1: Investigation of advanced structural component design concepts [AD-A024662] 13 p0102 N77-12052
- HELICOPTER PERFORMANCE**  
Flight test development of a helicopter-towed surface delivery system 15 p0317 A77-38006
- Energy aspects of VTOL aircraft in comparison with other air and ground vehicles 16 p0419 A77-43333
- HELICOPTERS**  
Helicopter offshore operations --- oil and gas exploration and production 16 p0421 A77-44437
- Identifying and analyzing methods for reducing the energy consumption of helicopters [NASA-CR-144953A] 15 p0388 N77-27104
- HELIOS PROJECT**  
A small but important contribution to the German-American solar research programme 'Helios' 15 p0323 A77-39125
- HELIOSTATS**  
Conceptual heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility at Sandia, Albuquerque 15 p0318 A77-38209
- Power with heliostats 16 p0433 A77-47174
- Prisms with total internal reflection as solar reflectors 16 p0488 A77-49071
- HELIUM**  
The helium turbine - A power station of the future 14 p0138 A77-20951
- Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling [ASME PAPER 77-GT-2] 14 p0197 A77-28522
- Helium resources of the United States, 1973 [PB-252473/4] 13 p0085 N77-10623

- Concept for fluidized bed combustion of Consol  
char using a closed-cycle helium power plant  
with an estimate of the price of electric power  
[ERDA-76-69] 13 p0130 N77-15506
- Analysis of natural gases, 1975 14 p0228 N77-20197  
[PB-259351/5]
- Results of closed cycle MHD power generation test  
with a helium-cesium working fluid  
[NASA-TM-X-73621] 15 p0357 N77-23936
- Comprehensive report and investigation on helium  
uses  
[PB-263515/9] 15 p0370 N77-25280
- Helium research in support of superconducting  
power transmission  
[PB-265(76/0)] 15 p0390 N77-27326
- Power transmission project  
[BNL-22202] 16 p0551 N77-33426
- HELIUM ISOTOPES**
- The nature and characteristics of the distribution  
of helium and argon isotopes in the geothermal  
waters of the Kuril Islands and Kamchatka  
13 p0048 A77-13589
- Power deposition in He from the volumetric  
He-3/n,p/R-3 reaction --- for direct nuclear  
pumped lasers 16 p0426 A77-45307
- HELIUM-NEON LASERS**
- Influence of the spatial inhomogeneity of the  
field and amplifying medium on the energy  
characteristics of a gas laser 15 p0289 A77-34221
- HERMETIC SEALS**
- The storability of Li/SO<sub>2</sub> cells 16 p0447 A77-48730
- HERMITIAN POLYNOMIAL**
- A solar flux density calculation for a solar tower  
concentrator using a two-dimensional Hermite  
function expansion 16 p0405 A77-41578
- HEXAGONAL CELLS**
- Development of low cost, high energy-per-unit-area  
solar cell modules  
[NASA-CR-153977] 16 p0528 N77-30605
- HIERARCHIES**
- A parametric analysis of the structure of  
international energy consumption 15 p0298 A77-36242
- HIGH ALTITUDE BALLOONS**
- Ultralightweight solar array for Naval Sea Control  
Systems 13 p0040 A77-12828
- Utilization of wind energy for electrical power  
supplies to ESSOR stationary platforms ---  
tropospheric tethered balloon experiment  
16 p0427 A77-45610
- HIGH CURRENT**
- Ultra high-current superconducting cables for a  
2.2-tesla, 300-kilojoule energy storage magnet  
14 p0144 A77-21391
- HIGH FREQUENCIES**
- RF oscillations of a plasma in crossed E x H fields  
16 p0503 A77-50350
- Monitoring fluid flow by using high-frequency  
electromagnetic probing  
[UCRL-51579] 13 p0120 N77-14393
- HIGH PASS FILTERS**
- Waveguide high pass filter for thermal conversion  
of solar energy 13 p0073 A77-19054
- HIGH PRESSURE**
- Water electrolysis under pressure - Improvement of  
energy efficiency by temperature increase  
15 p0277 A77-33360
- Performance characteristics of a high-pressure,  
moderate temperature, electrolysis system ---  
for hydrogen-based energy storage 15 p0277 A77-33361
- A wind energy system utilizing high pressure  
electrolysis as a storage mechanism 15 p0279 A77-33376
- Particulate sampling at high temperature and high  
pressure --- of coal conversion processes  
15 p0293 A77-35172
- Performance characteristics of a high-pressure,  
moderate temperature, electrolysis system  
14 p0238 N77-21595
- A wind energy system utilizing high pressure  
electrolysis as a storage mechanism 14 p0240 N77-21610
- HIGH SPEED**
- High-speed flywheels as possible energy storage  
devices in the future 13 p0056 A77-15856
- HIGH STRENGTH STEELS**
- Selection of structural materials for hydrogen  
pipelines and storage vessels 15 p0281 A77-33390
- HIGH TEMPERATURE**
- Electrochemical power and hydrogen generation from  
high temperature electrolytic cells  
13 p0025 A77-12709
- Transient performance characteristics of a high  
temperature distributed solar collector field  
13 p0037 A77-12810
- Cost optimal deployment of mirrors associated with  
a high temperature solar energy system  
14 p0181 A77-25901
- Design and costs of high temperature thermal  
storage devices using salts or alloys  
[ASME PAPER 76-WA/HT-34] 14 p0187 A77-26481
- Particulate sampling at high temperature and high  
pressure --- of coal conversion processes  
15 p0293 A77-35172
- High temperature thermal energy storage system,  
Na<sub>2</sub>SO<sub>4</sub> + SO<sub>3</sub> reversibly yields Na<sub>2</sub>SO<sub>3</sub>  
16 p0450 A77-48764
- High temperature solar collector with an  
Archimedes concentrator 16 p0460 A77-48833
- High temperature thermal energy storage  
16 p0491 A77-49099
- High-temperature energy storage in native rocks  
16 p0492 A77-49104
- Survey of high temperature thermal energy storage  
[SAND-75-8063] 13 p0088 N77-10655
- High temperature gas turbine engine component  
materials testing program  
[FE-1765-7] 13 p0127 N77-15401
- Low to high temperature energy conversion system  
[NASA-CASE-NPO-13510-1] 16 p0545 N77-32581
- HIGH TEMPERATURE AIR**
- Progress on the testing of refractories for  
directly-fired MHD air heater service. II  
15 p0328 A77-39544
- Ignition and combustion behavior of pulverized  
coal jets in hot oxidizing atmospheres --- for  
MHD systems 15 p0331 A77-39568
- HIGH TEMPERATURE ENVIRONMENTS**
- Silicon solar cell development for  
concentrated-sunlight, high-temperature  
applications  
[SAND-76-5311] 15 p0380 N77-26647
- HIGH TEMPERATURE FLUIDS**
- Geothermal hot water pump --- for use in reservoirs  
[PB-261741/3] 14 p0251 N77-21711
- HIGH TEMPERATURE GAS COOLED REACTORS**
- The helium turbine - A power station of the future  
14 p0138 A77-20951
- Competitively priced hydrogen via high-efficiency  
nuclear electrolysis 14 p0171 A77-23720
- Hydroretorting of oil shale with nuclear process  
heat  
[ASME PAPER 76-WA/EMER-3] 14 p0185 A77-26432
- Description, output and development prospects of a  
750 C helium direct cycle nuclear power plant  
with a single turbomachine and intermediate  
cooling  
[ASME PAPER 77-GT-2] 14 p0197 A77-28522
- Hydrogen production process by means of nuclear  
energy 15 p0273 A77-33327
- Water splitting - A progress report --- hydrogen  
production using high temperature gas-cooled  
reactor 15 p0274 A77-33330
- Hydrogen production from coal using a nuclear heat  
source 15 p0275 A77-33339
- Efficiency and cost advantages of an  
advanced-technology nuclear electrolytic  
hydrogen-energy production facility  
15 p0302 A77-36344
- Gas turbine HTGR - A total energy utilization option  
--- High Temperature Gas-cooled Reactor  
[AIAA 77-1016] 16 p0403 A77-41560

# SUBJECT INDEX

# HYBRID PROPULSION

- Dual purpose nuclear power plants for military installations [AD-A026141] 13 p0132 N77-15521
- Gas cooled reactor assessment, volume 1 [TID-27424-VOL-1] 16 p0541 N77-31945
- HIGH TEMPERATURE GASES**
- Evaporation of solution droplets in a high-temperature medium --- potassium carbonate MHD flow properties 13 p0046 A77-13254
- Evaporation of a drop of solution in a high-temperature medium --- potassium carbonate MHD flow properties 15 p0263 A77-31534
- Oxidation-erosion of materials in high velocity hot gases 15 p0270 A77-32604
- Laser anemometry in high velocity, high temperature boundary layers 15 p0288 A77-33708
- High temperature gas turbine engine [PE-1765-8] 13 p0120 N77-14488
- HIGH TEMPERATURE NUCLEAR REACTORS**
- Energy storage via calcium hydride production 13 p0032 A77-12774
- Environment and energy production after the year 2000 13 p0056 A77-16203
- Coal gasification and its relation to tested power plants 14 p0136 A77-20074
- Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors 14 p0175 A77-24210
- Design studies of the hydrogasification of coal 14 p0175 A77-24214
- The concept of 'nuclear hydrogen production' and progress of work in the Nuclear Research Center Juelich 15 p0273 A77-33328
- Improvements in energy conversion technology 16 p0505 A77-51154
- Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors [INIS-MF-1965] 13 p0084 N77-10228
- Gas cooled reactor assessment, volume 1 [TID-27424-VOL-1] 16 p0541 N77-31945
- HIGH TEMPERATURE RESEARCH**
- Shock tube for investigations of high-temperature MHD generators 13 p0054 A77-15665
- Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096
- Hydrogen production with HOT ELLY --- high temperature vapor phase-electrolysis of water 15 p0269 A77-32404
- Processing of experimental data with the U-25 facility with the aid of a data measuring system --- MHD generator 15 p0269 A77-32521
- Symposium on Engineering Problems of Fusion Research, 6th, San Diego, Calif., November 18-21, 1975, Proceedings 16 p0425 A77-44975
- Practical reasons for investigating ion transport in high temperature insulating materials --- for energy conversion efficiency [CONF-760831-2] 14 p0227 N77-19935
- Feasibility of hydrogen production by direct water splitting at high temperature 14 p0240 N77-21606
- An investigation of hydrogen production from water at high temperatures 14 p0240 N77-21607
- HIGH TEMPERATURE TESTS**
- Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides 13 p0056 A77-15817
- The evaluation of electrode materials for slag coated MHD channels 15 p0328 A77-39545
- Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator 15 p0329 A77-39554
- Comparative kinetics of high-temperature reaction, between H2S and selected metal oxides 16 p0424 A77-44608
- Georgia Tech high temperature solar test facility 16 p0500 A77-49745
- The 275 deg C microcircuitry: Resistors, capacitors, conductors, substrates, and bonding [SAND-76-0611] 15 p0389 N77-27312
- HIGH VOLTAGES**
- The lensed high-voltage vertical multi-junction solar cell 13 p0069 A77-18489
- New analysis of a high-voltage vertical multi-junction solar cell 13 p0069 A77-18490
- Reply to 'New analysis of a high-voltage vertical multi-junction solar cell' 13 p0069 A77-18491
- High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851
- Repetitive series Interrupter II [AD-A035267] 15 p0371 N77-25447
- HIGHWAYS**
- Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576
- HISTORIES**
- Historical trends in coal utilization and supply [PB-261278/6] 15 p0341 N77-22295
- HONEYCOMB STRUCTURES**
- Use of Lexan and Kapton honeycombs to increase solar collector efficiency 13 p0068 A77-18448
- Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions [ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508
- Transparent glass honeycomb structures for energy loss control --- for solar collectors [SAM/1084-75/1] 14 p0248 N77-21673
- Development of plastic honeycomb flat-plate solar collectors [SAM/1081-76/1] 15 p0372 N77-25640
- HOSPITALS**
- Solid waste incineration and energy recovery in hospitals 15 p0272 A77-33283
- HOT WEATHER**
- Climate based solar house design - Hot and humid Charleston, S.C. 16 p0478 A77-48991
- HUMAN BEINGS**
- Introduction: Man and his total environment 16 p0544 N77-32554
- HUMAN WASTES**
- China claims lead in biogas energy supply 15 p0297 A77-36050
- HUMIDITY**
- Energy from humid air [AIAA PAPER 77-730] 15 p0311 A77-37253
- HUNGARY**
- Research and development of geothermal energy production in Hungary 14 p0163 A77-23034
- HYBRID CIRCUITS**
- Analysis of GaAs and Si solar energy hybrid systems [NASA-CR-2800] 14 p0229 N77-20564
- HYBRID COMPUTERS**
- Quasi-analog models of large systems of algebraic equations 16 p0433 A77-46959
- HYBRID PROPULSION**
- Hybrid propulsion systems for electric road vehicles for short range public passenger transport test and operational experience - Prospects 14 p0159 A77-22881
- Hybrid propulsion system for motor vehicles with predominantly intermittent mode of operation 14 p0171 A77-23900

- Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705
- Battery-flywheel hybrid electric power system for near term application. Volume 2: System design [UCID-17098-VOL-2] 14 p0228 A77-20443
- Composite flywheel development [Y-2072] 15 p0388 A77-27194
- HYDRATION**
- Hydration-dehydration cycling of MgO-Mg(OH)<sub>2</sub> for application to solar heat storage systems [AI-ERDA-13178] 15 p0381 A77-26654
- HYDRAULIC EQUIPMENT**
- The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854
- Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base' [ASLE PREPRINT 77-AM-2A-1] 15 p0296 A77-35956
- Hydraulic ram effect on composite fuel cell entry walls [AD-A024832] 13 p0115 A77-13548
- A study of the failure of joints in composite material fuel cells due to hydraulic ram loading [AD-A027258] 13 p0117 A77-14016
- Borehole hydraulic coal mining system analysis [NASA-CR-154119] 16 p0512 A77-28558
- Installation in Dakar of a pump powered by solar cell panels 16 p0546 A77-32589
- HYDRAULIC FLUIDS**
- Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base' [ASLE PREPRINT 77-AM-2A-1] 15 p0296 A77-35956
- Safety flywheel [NASA-CASE-HQN-10888-1] 15 p0342 A77-22484
- HYDRIDES**
- Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770
- The behavior of iron titanium hydride test beds - Long-term effects, heat transfer and modeling 15 p0280 A77-33386
- Automotive hydride tank design 15 p0282 A77-33399
- Automotive hydride tank design 14 p0244 A77-21637
- Hydrogen compatibility of structural materials for energy storage and transmission applications [SAND-76-8255] 15 p0395 A77-27553
- HYDROBROMIC ACID**
- Hydrogen producing cycles using electricity and heat - Hydrogen halide cycles: Electrolysis of HBr 14 p0171 A77-23719
- HYDROCARBON COMBUSTION**
- Fluidised coal combustion - What can be done now 14 p0191 A77-27285
- Improved acid electrolytes for the hydrocarbon-air fuel cell 14 p0195 A77-28166
- Whatever happened to the Wankel engine 15 p0272 A77-33125
- Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79] 15 p0321 A77-38533
- The oxidant formation potential of emissions from catalyst-equipped vehicles 15 p0333 A77-39596
- Burner design criteria for control of NO<sub>x</sub> from natural gas combustion. Volume 1: Data analysis and summary of conclusions [PB-254167/0] 13 p0091 A77-10686
- Burner design criteria for control of NO<sub>x</sub> from natural gas combustion. Volume 2: Raw data and experimental results [PB-256806/1] 13 p0115 A77-13549
- HYDROCARBON FUEL PRODUCTION**
- Hydrocarbon fuels from oil shale 13 p0023 A77-12692
- In situ combustion of Michigan oil shale - Current field studies 13 p0024 A77-12695
- Retorting of single oil shale blocks with nitrogen and air 13 p0024 A77-12696
- Nuclear power for the production of synthetic fuels and feedstocks 13 p0035 A77-12790
- Hydrocarbon cracking developments in the DDR 14 p0164 A77-23098
- Shale oil, tar sands, and related fuel sources --- Book 14 p0169 A77-23551
- Characteristics of synthetic crude from crude shale oil produced by in situ combustion retorting 14 p0169 A77-23552
- Sulfur compounds in oils from the Western Canada Tar Belt 14 p0169 A77-23553
- Hydrogasification of oil shale 14 p0169 A77-23556
- Production of synthetic crude from crude shale oil produced by in situ combustion retorting 14 p0169 A77-23557
- Fracturing oil shale with explosives for in situ recovery 14 p0169 A77-23559
- Largest ever liquefaction plant will test H-coal process 14 p0184 A77-26289
- Evaluation of the practical aspects of the use of coal derived synthetic fuels [ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411
- A new concept for the manufacture of low sulfur fuels and chemicals from coal 14 p0192 A77-27295
- Mobil process for the conversion of methanol to gasoline 14 p0193 A77-27299
- Kinetics of heterogeneously catalyzed coal hydroliquefaction 14 p0196 A77-28473
- Reactivity heat-treated coals in hydrogen --- for synthetic methane production 14 p0198 A77-28777
- Considerations on coal gasification 15 p0266 A77-32169
- Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process 15 p0267 A77-32247
- Molecular synthesis in the case of the Fischer-Tropsch synthesis - Reaction steps of the molecular synthesis by means of the catalytic transformation of carbon monoxide and hydrogen 15 p0268 A77-32248
- Synthesis of substitute natural gas on the basis of coal 15 p0268 A77-32249
- Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis 15 p0298 A77-36254
- Economics of ethylene production via pyrolysis of coal based Fischer-Tropsch hydrocarbons 15 p0301 A77-36339
- Comparative economics for the Arthur D. Little extractive coking process 15 p0301 A77-36340
- An integrated process model of the Fischer-Tropsch process for liquid fuels production from coal 15 p0318 A77-38213
- Packed bed digestion of solid wastes 15 p0323 A77-39107
- Modelling of entrained-bed pulverized coal gasifiers 16 p0401 A77-41321
- Gasification - Theory and application --- of coal 16 p0402 A77-41448
- Mathematical method for determining reaction networks in chemical systems 16 p0418 A77-43093
- What's holding up coal gasification 16 p0423 A77-44522
- Liquid fuels and chemical feedstocks from coal by supercritical gas extraction 16 p0429 A77-46449
- Methane production from solid waste 16 p0434 A77-47218
- Soluble-salt processes for in-situ recovery of hydrocarbons from oil shale 16 p0441 A77-48472



## SUBJECT INDEX

## HYDROELECTRIC POWER STATIONS

- Methane production through bioconversion of agriculture residues 16 p0489 A77-49081
- The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology 16 p0505 A77-51156
- HYDROCARBON FUELS**
- Catalytic hydrogenation of solvent-refined lignite to liquid fuels 13 p0008 A77-11243
- Evaluation of coal liquefaction efficiency based on various ranks 13 p0009 A77-11244
- Fuel cell assemblies with an acidic electrolyte 13 p0055 A77-15816
- Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids 14 p0145 A77-21623
- Characterization of synthetic liquid fuels --- analytical separation and spectroscopic techniques 14 p0169 A77-23554
- Hydrocarbon fuel conditioner for a 1.5 kW fuel cell power plant 14 p0195 A77-28168
- Thermally induced migration of hydrocarbon oil 15 p0268 A77-32375
- The K-T process - Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 15 p0275 A77-33338
- The production of shale oil crude and its refining into military operational fuels 15 p0292 A77-35155
- Direct production of methane and benzene from coal 15 p0306 A77-36766
- Synthetic carbonaceous fuel and feedstock using nuclear power, air and water 15 p0321 A77-38532
- Options for the conversion of fossil fuels 15 p0335 A77-39835
- Hydrocarbon deposits beyond the shelf edge of the oceans 16 p0400 A77-40682
- Production of a hydrocarbon-type synthetic fuel from wood [NRC-15638] 13 p0127 A77-15210
- Environmental effects of solid waste as a supplemental fuel [IS-3852] 14 p0211 A77-17567
- Approaches to chemical class analyses of fossil derived materials [CONF-770301-5] 16 p0532 A77-31271
- HYDROCARBONS**
- Distribution of some hydrocarbons in ambient air near Delft and the influence on the formation of secondary air pollutants 15 p0271 A77-32954
- Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base' [ASLE PREPRINT 77-AH-2A-1] 15 p0296 A77-35956
- Two-phase working fluids for the temperature range 100-350 C --- in heat pipes for solar applications [AIAA PAPER 77-753] 15 p0312 A77-37266
- The ecology of a marine littoral receiving effluents from a petroleum refinery 16 p0433 A77-47173
- A characterization of the sources of petroleum hydrocarbons in Lake Washington 16 p0439 A77-48099
- The use of mixture working fluids in geothermal binary power cycles 16 p0455 A77-48802
- Catalytic synthesis of gaseous hydrocarbons [FE-1814-2] 13 p0130 A77-15503
- In-situ laser retorting of oil shale [NASA-CASE-LEN-12217-1] 14 p0214 A77-18429
- Research on electrochemical energy conversion systems [AD-A034454] 15 p0367 A77-24632
- Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks [PB-262789/1] 15 p0371 A77-25551
- Conversion of waste organic material to gasoline [COO-2982-7] 15 p0377 A77-26325
- Hydrocarbon fuels from solar energy via the alga *Botryococcus brauni* [ARL/HECH-ENG-148] 16 p0513 A77-28576
- HYDRODYNAMIC EQUATIONS**
- Influence of various losses on the characteristics of high-power MHD generators 13 p0046 A77-13258
- Hydrodynamics and compression of a laser irradiated target --- fusion energy requirements 14 p0146 A77-21745
- Effect of various losses on the characteristics of powerful MHD generators 15 p0263 A77-31538
- HYDRODYNAMICS**
- An analytical study of the maximal heat-carrying capacity of heat pipes 16 p0411 A77-42260
- HYDROELECTRIC POWER STATIONS**
- Experience in putting the Kiskadee hydroelectric power plant on line 13 p0010 A77-11301
- Water power in the immediate future 13 p0056 A77-15850
- Nova Scotia seeks to cut oil bill for power generation 13 p0063 A77-17588
- Storage of solar energy in the form of potential hydraulic energy 13 p0075 A77-19078
- Energy considerations in HHE power systems --- Heliohydroelectric and Helioelectrolytic systems 13 p0077 A77-19099
- Hydel and solar power for Pakistan --- hydroelectric power 13 p0079 A77-19121
- Pumped-storage electric power generating plants 14 p0166 A77-23373
- Energy recovery by mini-hydroelectric projects 14 p0183 A77-26089
- Net energy analyses for liquid-dominated and vapor-dominated hydrothermal energy-resource developments 14 p0194 A77-27351
- The Greenland hydropower as a source of electrolytic hydrogen 15 p0285 A77-33416
- California's aqueduct offers peaking power to Los Angeles 16 p0400 A77-40893
- Predicting the rate of warming of rivers below hydroelectric installations 16 p0437 A77-47749
- Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units 13 p0096 A77-11525
- Concrete placing techniques used during the construction of the Krasnoyarsk hydroelectric power plant [AD-A026967] 13 p0121 A77-14528
- Analysis of information systems for hydropower operations: Executive summary [NASA-CR-149342] 13 p0122 A77-14586
- Analysis of information systems for hydropower operations [NASA-CR-149373] 13 p0129 A77-15497
- Existing and proposed fuel conversion facilities. Summary [PB-258264/1] 14 p0208 A77-16457
- Ocean thermal energy delivery systems based on chemical energy carriers 14 p0240 A77-21609
- The Greenland hydropower as a source of electrolytic hydrogen 14 p0246 A77-21655
- Electric power development in the Pacific Northwest Region: Institutional commitments and alternatives, phase 1 [PB-262382/5] 15 p0348 A77-22671
- Assessment of energy storage systems suitable for use by electric utilities, volume 3 [EPRI-EM-264-VOL-3] 16 p0537 A77-31636
- Pumped storage potential of the Bell's Canyon area [PB-267722/7] 16 p0539 A77-31664
- Ecological review of hydroelectric reservoirs in Puerto Rico [CEER-1] 16 p0540 A77-31673

- Research into the impact on electrical equipment from variable speed operation of pumped-storage plants  
[PB-268323/3] 14 p0548 N77-32618
- HYDROFLUORIC ACID**  
Improving MIS silicon solar cells by HF-treatment of the insulating oxide layer 14 p0151 A77-21819
- HYDROFOIL CRAFT**  
Hydrodynamic equilibrium conditions for AG(ZH) main strut-pod foil system using flap incidence control  
[AD-A027521] 13 p0127 N77-15220
- HYDROGEN**  
Near-uv photon efficiency in a TiO<sub>2</sub> electrode - Application to hydrogen production from solar energy 13 p0015 A77-11947  
Catalytic coal liquefaction using synthesis gas 13 p0059 A77-16473  
Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813  
Hydrogen producing cycles using electricity and heat - Hydrogen halide cycles: Electroclysis of HBr 14 p0171 A77-23719  
Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0171 A77-23720  
HYGAS process update --- hydrogen gasification of coal 14 p0192 A77-27296  
Coal devolatilization and hydrogasification 14 p0200 A77-29450  
Molecular synthesis in the case of the Fischer-Tropsch synthesis - Reaction steps of the molecular synthesis by means of the catalytic transformation of carbon monoxide and hydrogen 15 p0268 A77-32248  
The Westinghouse Sulfur Cycle for the thermochemical decomposition of water 15 p0277 A77-33354  
Development of a low capital cost electrolyzer --- for hydrogen production 15 p0277 A77-33362  
Modern technology electrolysis for power application 15 p0278 A77-33364  
The photosynthetic production of hydrogen 15 p0278 A77-33368  
Bioconversion of solar energy in salt water photosynthetic hydrogen production systems 15 p0278 A77-33369  
The theory of hydrogen production in a photoelectrochemical cell 15 p0279 A77-33370  
Feasibility of hydrogen production by direct water splitting at high temperature 15 p0279 A77-33372  
An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 15 p0283 A77-33406  
Closed Brayton cycle using hydrogen as a work fluid [BNL-20899] 13 p0085 N77-10542  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods [BNL-20877] 13 p0087 N77-10648  
Metal hydrides as hydrogen storage media and their applications [BNL-21648] 14 p0231 N77-20589  
Production of ammonia using coal as a source of hydrogen [PB-259388/7] 14 p0233 N77-20613  
Hydrogen combustion. Part 1: Investigation of hydrogen flame control methods [CTI-IV-75-01449] 14 p0235 N77-21204  
First World Hydrogen Energy Conference proceedings, volume 1 14 p0237 N77-21552  
Hydrogen production process by means of nuclear energy 14 p0237 N77-21553  
Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0237 N77-21558
- Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 14 p0237 N77-21564  
The manufacture of hydrogen from coal 14 p0237 N77-21566  
Hydrogen production from coal using a nuclear heat source 14 p0238 N77-21568  
Thermodynamics of thermochemical water decomposition processes 14 p0238 N77-21574  
Discovery of reaction sequences for thermochemical water splitting 14 p0238 N77-21575  
Effective conversion processes between thermal and chemical energies: Thermodynamic study of multistep water decomposition processes 14 p0238 N77-21576  
Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process 14 p0238 N77-21582  
The Westinghouse sulfur cycle for the thermochemical decomposition of water 14 p0238 N77-21587  
Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle 14 p0238 N77-21589  
New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 14 p0243 N77-21629  
Energy storage possibilities of atomic hydrogen 14 p0245 N77-21643  
The Greenland hydropower as a source of electrolytic hydrogen 14 p0246 N77-21655  
Economics of nuclear - electrolytic hydrogen 14 p0247 N77-21659  
Hydrogen storage, water electrolysis and fuel cells for electric energy storage [BNL-21498] 15 p0344 N77-22620  
International Conference on Hydrogen and its Prospects [AD-A036936] 15 p0385 N77-26696  
Hydrogen storage by binary and ternary intermetallics for energy applications: A review [UCRL-52110] 15 p0394 N77-27548  
Hydrogen-halogen energy storage system: Preliminary feasibility and economic assessment [BNL-22164] 16 p0537 N77-31635  
Solar photolysis of water [NASA-CASE-NPO-13675-1] 16 p0544 N77-32580
- HYDROGEN ATOMS**  
Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405  
Hydrogen atoms: Rare earth ions: Magnetic resonance studies on polycrystalline solids and surface systems relevant to catalysis and other energy-related research 13 p0117 N77-13798
- HYDROGEN COMPOUNDS**  
Electric current from the direct conversion of low molecular weight C,H,O-compounds 13 p0055 A77-15814  
An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 14 p0245 N77-21644
- HYDROGEN FUELS**  
Onboard hydrogen generation for automobiles 13 p0020 A77-12663  
Hydrogen production by the steam-iron process 13 p0023 A77-12688  
Electrochemical power and hydrogen generation from high temperature electrolytic cells 13 p0025 A77-12709  
Energy storage via calcium hydride production 13 p0032 A77-12774  
Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777  
Survey of hydrogen energy application projects 13 p0033 A77-12778  
The performance of hydrogen-injected reciprocating engines 13 p0033 A77-12780  
An alternative fuel for cars --- hydrogen production and storage 13 p0050 A77-14530

# SUBJECT INDEX

# HYDROGEN OXYGEN FUEL CELLS

Liquid hydrogen as propellant for commercial aircraft  
[DGLR PAPER 76-188] 13 p0059 A77-16534

Hydrogen as a fuel in compression ignition engines 13 p0071 A77-18932

The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0171 A77-23718

Water induction in hydrogen-powered IC engines 14 p0171 A77-23721

Reactions in the ZnSe thermochemical cycle for hydrogen production 14 p0178 A77-24854

Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases 14 p0195 A77-28050

Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock 14 p0200 A77-29437

Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593

World Hydrogen Energy Conference, 1st, Miami Beach, Fla., March 1-3, 1976, Proceedings. Volumes 1, 2 & 3 15 p0273 A77-33326

Balance and optimization procedure for thermochemical cycles for hydrogen production 15 p0276 A77-33345

Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353

Microbial hydrogen production 15 p0278 A77-33367

A study of the efficiency of hydrogen liquefaction --- jet aircraft applications 15 p0279 A77-33377

A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 15 p0279 A77-33378

Technical and environmental aspects of underground hydrogen storage 15 p0279 A77-33379

Hydrogen storage on highway vehicles - Update '76 15 p0280 A77-33380

Hydrogen vehicular fuel storage as a step in a water splitting cycle 15 p0280 A77-33381

Methods of on-board generation of hydrogen for vehicular use 15 p0280 A77-33383

Automotive fuel-saving system with on-board hydrogen generation and injection into I. C. engines 15 p0280 A77-33384

A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 15 p0283 A77-33407

Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 15 p0284 A77-33409

A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives 15 p0285 A77-33421

A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen 15 p0302 A77-36343

Hydrogen peroxide emission levels from a hydrogen fueled combustion engine 16 p0399 A77-40644

Alternate fuels for future aircraft 16 p0444 A77-48709

The liquid hydrogen option for the subsonic transport - A status report 16 p0458 A77-48819

An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports [NASA-CR-2699] 13 p0083 A77-10033

Hydrogen-fueled subsonic aircraft: A perspective 13 p0084 A77-10344

Hydrogen-rich gas generator [NASA-CASE-NPO-13560-1] 13 p0086 A77-10636

Hydrogen energy conversion --- for thermodynamic efficiency and cost effectiveness [AD-A030370] 14 p0218 A77-18601

A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 14 p0240 A77-21612

Hydrogen vehicular fuel storage as a step in a water splitting cycle 14 p0242 A77-21615

Hydrogen-powered highway vehicles: Applications and optimum form of fuel storage 14 p0242 A77-21616

Methods of on-board generation of hydrogen for vehicular use 14 p0242 A77-21617

First World Hydrogen Energy Conference proceedings, volume 3 14 p0243 A77-21626

The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0243 A77-21627

Fuel subsystem characteristics for LH2 aircraft 14 p0243 A77-21630

Water induction in hydrogen-powered IC engines 14 p0243 A77-21631

Development of a liquid hydrogen car 14 p0244 A77-21632

Dynamic tests of hydrogen-powered IC engines --- for mass transit vehicles 14 p0244 A77-21633

Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 A77-21634

Crash test of a liquid hydrogen automobile 14 p0244 A77-21635

Prototype hydrogen automobile using a metal hydride 14 p0244 A77-21636

Automotive hydride tank design 14 p0244 A77-21637

A hydrogen-powered mass transit system 14 p0244 A77-21638

Use of hydrogen in automotive engines 14 p0244 A77-21639

Hydrogen safety problems 14 p0245 A77-21640

Technical prospects for commercial and residential distribution and utilization of hydrogen 14 p0245 A77-21642

A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 14 p0245 A77-21645

Performance characteristics of turbo-rockets and turbo-ramjets using high energy fuel 15 p0339 A77-22131

Hydrogen-enrichment-concept preliminary evaluation [NASA-CR-152814] 15 p0340 A77-22290

Emissions and total energy consumption of a multicylinder piston engine running on gasoline and a hydrogen-gasoline mixture [NASA-TN-D-8487] 15 p0353 A77-23114

Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines [TR8E-1036] 16 p0511 A77-28324

The hydrogen economy: A preliminary technology assessment [PB-266607/1] 16 p0512 A77-28329

**HYDROGEN OXYGEN ENGINES**

Hydrogen as a fuel in compression ignition engines 13 p0071 A77-18932

Near-term chemically-propelled space transport systems --- to space colonies 15 p0295 A77-35810

**HYDROGEN OXYGEN FUEL CELLS**

Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems 13 p0064 A77-18019

Air electrodes for H2-air fuel cells with alkali electrolyte 13 p0065 A77-18196

A comparison of porous silver catalysts in oxygen electrodes of alkaline fuel cells 13 p0067 A77-18350

- Performance characteristics of a high-pressure, moderate temperature, electrolysis system --- for hydrogen-based energy storage 15 p0277 A77-33361
- Heat and mass transfer analysis of Bacon-type hydrogen-oxygen fuel cells - The volume average velocity 15 p0321 A77-38531
- Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells 16 p0420 A77-44059
- The electrical power system for Spacelab 16 p0432 A77-46789
- An off-peak energy storage concept for electric utilities. I - Electric utility requirements 16 p0499 A77-49348
- Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell 16 p0500 A77-50200
- HYDROGEN PEROXIDE**
- Hydrogen peroxide emission levels from a hydrogen fueled combustion engine 16 p0399 A77-40644
- HYDROGEN PLASMA**
- Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator [NASA-TN-D-8374] 14 p0213 N77-17852
- HYDROGEN PRODUCTION**
- The theory of hydrogen production in a photoelectrochemical cell 13 p0075 A77-19075
- The photosynthetic production of hydrogen 13 p0075 A77-19077
- New hydrogen process is in the works 14 p0205 A77-29789
- The concept of 'nuclear hydrogen production' and progress of work in the Nuclear Research Center Juelich 15 p0273 A77-33328
- The aqueous homogeneous reactor as a source of hydrogen and of process heat 15 p0274 A77-33329
- Water splitting - A progress report --- hydrogen production using high temperature gas-cooled reactor 15 p0274 A77-33330
- Hydrogen production from nuclear waste energy 15 p0274 A77-33331
- Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy 15 p0274 A77-33334
- The manufacture of hydrogen from coal 15 p0275 A77-33337
- Hydrogen production from coal using a nuclear heat source 15 p0275 A77-33339
- The calcium-iodine cycle for the thermochemical decomposition of water 15 p0275 A77-33340
- Discovery of reaction sequences for thermochemical water splitting --- in hydrogen production cycles 15 p0275 A77-33343
- Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344
- A thermochemical data bank for cycle analysis --- water decomposition for hydrogen production 15 p0276 A77-33346
- The compatibility of containment materials for thermochemical hydrogen production 15 p0276 A77-33347
- Laboratory investigations on thermochemical hydrogen production 15 p0276 A77-33348
- Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle 15 p0277 A77-33356
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 15 p0277 A77-33359
- Water electrolysis under pressure - Improvement of energy efficiency by temperature increase 15 p0277 A77-33360
- Performance characteristics of a high-pressure, moderate temperature, electrolysis system --- for hydrogen-based energy storage 15 p0277 A77-33361
- Development of a low capital cost electrolyzer --- for hydrogen production 15 p0277 A77-33362
- Modern technology electrolysis for power application 15 p0278 A77-33364
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 15 p0278 A77-33365
- Microbial hydrogen production 15 p0278 A77-33367
- The photosynthetic production of hydrogen 15 p0278 A77-33368
- A wind energy system utilizing high pressure electrolysis as a storage mechanism 15 p0279 A77-33376
- Hydrogen vehicular fuel storage as a step in a water splitting cycle 15 p0280 A77-33381
- Methods of on-board generation of hydrogen for vehicular use 15 p0280 A77-33383
- The Greenland hydropower as a source of electrolytic hydrogen 15 p0285 A77-33416
- Economics of nuclear-electrolytic hydrogen 15 p0285 A77-33419
- Thermochemical hydrogen production via a cycle using barium and sulfur - Reaction between barium sulfide and water 15 p0321 A77-38529
- Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79] 15 p0321 A77-38533
- Hydrogen by electrolysis to supplement pipeline gas supplies Technical and economic aspects [AIAA 77-1032] 16 p0405 A77-41569
- Hydrogen-via-Electricity - A candidate transitional transportation energy system concept [AIAA 77-1034] 16 p0405 A77-41570
- Hydrogen and oxygen from water 16 p0430 A77-46573
- Hydrogen and electricity from water and light 16 p0430 A77-46609
- The future of hydrogen as an energy source --- nuclear-powered water electrolysis 16 p0438 A77-47848
- ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 16 p0457 A77-48812
- Development progress on the Sulfur Cycle Water Decomposition System --- for hydrogen production 16 p0457 A77-48813
- Irreversibilities, heat penalties, and economics for the methanol/sulfuric acid process --- for hydrogen production 16 p0457 A77-48814
- Recent developments in the engineering and chemistry of the ZnSe thermochemical hydrogen cycle 16 p0457 A77-48815
- Irreversibilities in thermochemical cycles for hydrogen production by water decomposition 16 p0457 A77-48816
- Supercorrodng alloys for generating heat and hydrogen gas 16 p0458 A77-48820
- Hydrogen separation and production from coal-derived gases using Fe/x/TiNi<sub>1-x</sub>/ 16 p0458 A77-48821
- An assessment of hydrogen as a means to store solar energy 16 p0492 A77-49107
- Hydrogen quantum yields in the 360 nm photolysis of Eu<sup>2+</sup>/ solutions and their relationship to photochemical fuel formation 16 p0501 A77-50203
- Hydrogen production from water utilizing solar heat at high temperatures 16 p0501 A77-50205

Hydrogen production and storage in utility systems  
[BNL-50590] 16 p0515 N77-28600

Space power technology applied to the energy problem  
16 p0526 N77-30294

Technoeconomic analysis of large scale  
thermonuclear production of hydrogen  
[EPRI-EM-287] 16 p0532 N77-31336

Hydrogen generation process  
[FE-2262-3] 16 p0533 N77-31337

Hydrogen production from coal liquefaction residues  
[EPRI-AP-233] 16 p0551 N77-33374

**HYDROGEN SULFIDE**

Application of the Stretford process for H<sub>2</sub>S  
abatement at the Geysers geothermal power plant  
13 p0029 A77-12743

Progress on the selective removal of H<sub>2</sub>S from  
gasified coal using an immobilized liquid membrane  
15 p0318 A77-38146

Thermochemical hydrogen production via a cycle  
using barium and sulfur - Reaction between  
barium sulfide and water  
15 p0321 A77-38529

Tropospheric oxidation H<sub>2</sub>S  
16 p0411 A77-42254

Comparative kinetics of high-temperature reaction  
between H<sub>2</sub>S and selected metal oxides  
16 p0424 A77-44608

Hydrogen sulfide stress corrosion cracking in  
materials for geothermal power  
[COO-2576-3] 16 p0519 N77-29269

Determination of hydrogen sulfide in refinery fuel  
gases  
[PB-268240/9] 16 p0543 N77-32277

**HYDROGEN-BASED ENERGY**

The hydrogen economy --- production and applications  
13 p0006 A77-11041

Primary energy sources for hydrogen production  
13 p0011 A77-11335

Energy conversion via photoelectrolysis  
13 p0021 A77-12667

Benefits of hydrogen production research  
13 p0032 A77-12768

The commercial production of hydrogen by the K-T  
process  
13 p0032 A77-12769

Hydrogen separation and compression through  
hydride formation and dissociation by low-level  
heat  
13 p0032 A77-12770

Hydrogen from solar energy via water electrolysis  
13 p0032 A77-12771

Experimental demonstration of an iron chloride  
thermochemical cycle for hydrogen production  
13 p0032 A77-12772

Energy transmission from ocean thermal energy  
conversion plants  
13 p0032 A77-12773

Metal hydrides of improved heat transfer  
characteristics  
13 p0033 A77-12775

Some useful relationships between the physical and  
thermodynamic properties of metal hydrides  
13 p0033 A77-12776

Survey of hydrogen energy application projects  
13 p0033 A77-12778

A guide for the conversion to and maintenance of  
hydrogen-fueled, spark-ignited engines  
13 p0033 A77-12779

Performance of a hydrogen-powered  
transit vehicle  
13 p0033 A77-12781

Nuclear driven water decomposition plant for  
hydrogen production  
13 p0035 A77-12791

Radiolytic hydrogen production from a laser fusion  
system  
13 p0035 A77-12795

A hydride compressor  
13 p0046 A77-13336

Stage efficiency in the analysis of thermochemical  
water decomposition processes  
13 p0047 A77-13538

A new hydrogen storage electrode  
13 p0047 A77-13539

Hydrogen production using solar radiation  
13 p0048 A77-13540

Hydrogen production via thermochemical cycles  
based on sulfur chemistry  
13 p0048 A77-13541

Hydrogen storage via iron-titanium for a 26 MW/e/  
peaking electric plant  
13 p0048 A77-13543

Alternate fuels for road vehicles of the future  
13 p0051 A77-14584

Hydrogen production using nuclear  
heat  
13 p0057 A77-16211

Hydrogen production from water by means of  
chemical cycles  
13 p0058 A77-16471

The storage of energy in future energy supply  
systems  
[DGLR PAPER 76-182] 13 p0059 A77-16533

Solar production of hydrogen as a means of storing  
solar energy  
13 p0075 A77-19072

On the storage of solhydrogen  
13 p0075 A77-19073

Thermo-chemical production of hydrogen  
13 p0075 A77-19074

Solar energy utilization - The photochemical  
approach  
13 p0075 A77-19076

Conversion of solar energy by photosynthetic  
production of molecular hydrogen  
14 p0143 A77-21316

Entropy production, efficiency, and economy in the  
case of the thermochemical production of  
synthetic fuels - The sulfuric acid-hybrid  
process for thermochemical water decomposition  
14 p0145 A77-21544

Details of hydrogen-burning thermonuclear reactions  
14 p0168 A77-23457

International cooperation on development of  
hydrogen technologies  
14 p0171 A77-23717

Hydrogen producing cycles using electricity and  
heat - Hydrogen halide cycles: Electrolysis of HBr  
14 p0171 A77-23719

Hydrogen technology for energy --- Book  
14 p0180 A77-25824

Largest ever liquefaction plant will test H-coal  
process  
14 p0184 A77-26289

Evaluation of the practical aspects of the use of  
coal derived synthetic fuels  
[ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411

Hydrogen cycle peak-shaving on the New York State  
Grid using fuel cells  
14 p0199 A77-29094

New hydrogen process is in the works  
14 p0205 A77-29789

Performance data for a terrestrial solar  
photovoltaic/water electrolysis experiment  
15 p0256 A77-30321

Influence of bonding and filling agents on the  
activity of tungsten carbide hydrogen electrodes  
15 p0260 A77-31173

Hydrogen production with HOT ELLY --- high  
temperature vapor phase-electrolysis of water  
15 p0269 A77-32404

The impact of the new energy technologies  
15 p0272 A77-33124

World Hydrogen Energy Conference, 1st, Miami  
Beach, Fla., March 1-3, 1976, Proceedings.  
Volumes 1, 2 & 3  
15 p0273 A77-33326

Hydrogen production process by means of nuclear  
energy  
15 p0273 A77-33327

The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich  
15 p0273 A77-33328

The aqueous homogeneous reactor as a source of  
hydrogen and of process heat  
15 p0274 A77-33329

Water splitting - A progress report --- hydrogen  
production using high temperature gas-cooled  
reactor  
15 p0274 A77-33330

Hydrogen production from nuclear waste energy  
15 p0274 A77-33331

Peak power and heavy water production from  
electrolytic H<sub>2</sub> and O<sub>2</sub> using CANDU reactors  
15 p0274 A77-33332

- Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy 15 p0274 A77-33334
- Synthetic fuels from solid wastes and solar energy 15 p0275 A77-33336
- The manufacture of hydrogen from coal 15 p0275 A77-33337
- Hydrogen production from coal using a nuclear heat source 15 p0275 A77-33339
- The calcium-iodine cycle for the thermochemical decomposition of water 15 p0275 A77-33340
- Progress in the Los Alamos Scientific Laboratory Program to develop thermochemical processes for hydrogen production 15 p0275 A77-33341
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur-families 15 p0275 A77-33342
- Discovery of reaction sequences for thermochemical water splitting --- in hydrogen production cycles 15 p0275 A77-33343
- Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344
- A thermochemical data bank for cycle analysis --- water decomposition for hydrogen production 15 p0276 A77-33346
- The compatibility of containment materials for thermochemical hydrogen production 15 p0276 A77-33347
- Laboratory investigations on thermochemical hydrogen production 15 p0276 A77-33348
- Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process 15 p0276 A77-33350
- Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle 15 p0277 A77-33356
- Recent developments of large electrolytic hydrogen generators 15 p0277 A77-33358
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 15 p0277 A77-33359
- Water electrolysis under pressure - Improvement of energy efficiency by temperature increase 15 p0277 A77-33360
- Performance characteristics of a high-pressure, moderate temperature, electrolysis system --- for hydrogen-based energy storage 15 p0277 A77-33361
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 15 p0278 A77-33363
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 15 p0278 A77-33365
- A farm energy system employing hydrogen storage 15 p0278 A77-33366
- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374
- Ocean thermal energy delivery systems based on chemical energy carriers 15 p0279 A77-33375
- A wind energy system utilizing high pressure electrolysis as a storage mechanism 15 p0279 A77-33376
- Hydrogen-powered highway vehicles - Applications and optimum form of fuel storage 15 p0280 A77-33382
- Methods of on-board generation of hydrogen for vehicular use 15 p0280 A77-33383
- Titanium alloy hydrides - Their properties and applications 15 p0280 A77-33385
- A thermodynamic analysis of H<sub>2</sub>CO<sub>2</sub>, a hydrogen conversion and storage system 15 p0280 A77-33387
- A simple approach to metal hydride alloy optimization 15 p0281 A77-33388
- Potential structural material problems in a hydrogen energy system 15 p0281 A77-33389
- Selection of structural materials for hydrogen pipelines and storage vessels 15 p0281 A77-33390
- Some early perspectives on ground requirements of liquid hydrogen air transports 15 p0281 A77-33391
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392
- Fuel subsystem characteristics for LH<sub>2</sub> aircraft 15 p0281 A77-33393
- Development of a liquid hydrogen car 15 p0282 A77-33394
- Dynamic tests of hydrogen-powered IC engines 15 p0282 A77-33395
- Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396
- Crash test of a liquid hydrogen automobile 15 p0282 A77-33397
- Prototype hydrogen automobile using a metal hydride 15 p0282 A77-33398
- A hydrogen-powered mass transit system 15 p0282 A77-33400
- Use of hydrogen in automotive engines 15 p0283 A77-33401
- Hydrogen safety problems --- fuel systems hazard prevention 15 p0283 A77-33402
- Commodity hydrogen from off-peak electricity 15 p0283 A77-33403
- Technical prospects for commercial and residential distribution and utilization of hydrogen 15 p0283 A77-33404
- Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405
- On the storage of hydrogen by use of cryo-adsorbents 15 p0283 A77-33408
- Hydrogen energy - Its potential promises and problems 15 p0284 A77-33410
- Analysis of a Delphi study on hydrogen --- questionnaire survey on future energy utilization 15 p0284 A77-33411
- ERDA's hydrogen programs 15 p0284 A77-33412
- The NASA Hydrogen Energy Systems Technology study - A summary 15 p0284 A77-33413
- Technology impact assessment of the hydrogen economy concept - Key findings 15 p0284 A77-33414
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution 15 p0284 A77-33415
- The Greenland hydropower as a source of electrolytic hydrogen 15 p0285 A77-33416
- Hydrogen in the seaward advancement of industrial societies --- offshore energy production 15 p0285 A77-33417
- Hydrogen use projections and supply options 15 p0285 A77-33418
- Economics of nuclear-electrolytic hydrogen 15 p0285 A77-33419
- Hydrogen in the energy system of the Netherlands 15 p0285 A77-33420
- Possible pollution and cost analysis from wide use of hydrogen fuel in transportation 15 p0285 A77-33422
- Cathodes for photodriven hydrogen generators - ZnTe and CdTe 15 p0296 A77-35921

- Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344
- Solar energy depot --- using liquid hydrogen as fuel and oxygen as oxidizer [AIAA PAPER 77-726] 15 p0311 A77-37251
- OPTIMO - A method for process evaluation applied to the thermochemical decomposition of water 15 p0320 A77-38526
- Large scale hydrogen production utilizing carbon in renewable resources 15 p0321 A77-38527
- Thermolysis or electrolysis - Why we choose the latter --- water splitting for hydrogen production 15 p0321 A77-38528
- Thermochemical hydrogen production via a cycle using barium and sulfur - Reaction between barium sulfide and water 15 p0321 A77-38529
- Theoretical treatment of the photoelectrochemical production of hydrogen --- semiconductor electrode for solar applications 15 p0321 A77-38530
- U.S. options for a transition from oil and gas to synthetic fuels 15 p0335 A77-39836
- Hydrogen by electrolysis to supplement pipeline gas supplies Technical and economic aspects [AIAA 77-1032] 16 p0405 A77-41569
- Hydrogen-via-Electricity - A candidate transitional transportation energy system concept [AIAA 77-1034] 16 p0405 A77-41570
- Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures 16 p0412 A77-42406
- The future of hydrogen as an energy source --- nuclear-powered water electrolysis 16 p0438 A77-47848
- Direct-connect tests of hydrogen-fueled supersonic combustors 16 p0440 A77-48240
- ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- A new family of hydrogen storage alloys based on the system nickel-mischmetal-calcium 16 p0457 A77-48817
- A hydrogen-halogen energy storage system for electric utility applications 16 p0457 A77-48818
- The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology 16 p0505 A77-51156
- Hydrogen absorption in Ti3Al 16 p0506 A77-51372
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution [UCRL-76644] 13 p0087 N77-10652
- Metalhydrides [OUEL-1146/76] 13 p0094 N77-11158
- Hydrogen for energy storage: A progress report of technical developments and possible applications [BNL-20931] 13 p0094 N77-11201
- Hydrogen Energy: A bibliography with abstracts. Fourth quarter 1976 [NASA-CR-149864] 14 p0220 N77-19577
- Hydrogen Energy: A bibliography with abstracts. Third quarter 1976 [NASA-CR-149863] 14 p0220 N77-19578
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families 14 p0238 N77-21572
- Laboratory investigations on thermochemical hydrogen production 14 p0238 N77-21580
- First World Hydrogen Energy Conference proceedings, volume 2 14 p0238 N77-21591
- Recent developments of large electrolytic hydrogen generators 14 p0238 N77-21592
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 14 p0238 N77-21593
- Performance characteristics of a high-pressure, moderate temperature, electrolysis system 14 p0238 N77-21595
- Development of a low capital cost electrolyzer 14 p0239 N77-21596
- Modern technology electrolysis for power application --- concerning hydrogen production 14 p0239 N77-21598
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 14 p0239 N77-21599
- A farm energy system employing hydrogen storage 14 p0239 N77-21600
- Microbial hydrogen production 14 p0239 N77-21601
- The photosynthetic production of hydrogen 14 p0239 N77-21602
- Bioconversion of solar energy in salt water: Photosynthetic hydrogen production systems 14 p0239 N77-21603
- The theory of hydrogen production in a photoelectrochemical cell 14 p0239 N77-21604
- Hydrogen generation by photoelectrolysis of water 14 p0240 N77-21605
- Feasibility of hydrogen production by direct water splitting at high temperature 14 p0240 N77-21606
- An investigation of hydrogen production from water at high temperatures 14 p0240 N77-21607
- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 14 p0240 N77-21608
- A study of the efficiency of hydrogen liquefaction 14 p0240 N77-21611
- Technical and environmental aspects of underground hydrogen storage 14 p0242 N77-21613
- Hydrogen storage on highway vehicles: Update 1976 14 p0242 N77-21614
- Physical metallurgy of FeTi-hydride and its behavior in a hydrogen storage container 14 p0242 N77-21620
- The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling 14 p0242 N77-21621
- Selection of structural materials for hydrogen pipelines and storage vessels 14 p0243 N77-21625
- Commodity hydrogen from off-peak electricity 14 p0245 N77-21641
- An examination of the stirred reactor as a tool for the determination of rate constants of the H2-O2 combustion reactions 14 p0245 N77-21644
- On the storage of hydrogen by use of cryo-adsorbents 14 p0245 N77-21646
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 14 p0245 N77-21647
- Hydrogen energy: Its potential promises and problems 14 p0246 N77-21648
- Analysis of a Delphi study on hydrogen 14 p0246 N77-21649
- ERDA's hydrogen programs 14 p0246 N77-21650
- The NASA hydrogen energy systems technology study: A summary 14 p0246 N77-21651
- Perspectives on the evolution into a hydrogen economy 14 p0246 N77-21652
- Technology impact assessment of the hydrogen economy concept: Key findings 14 p0246 N77-21653
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution? 14 p0246 N77-21654
- Hydrogen in the seaward advancement of industrial societies 14 p0246 N77-21656
- Hydrogen use projections and supply options 14 p0247 N77-21658
- Hydrogen in the energy system of The Netherlands 14 p0247 N77-21660

- Hydrogen economy analysis using decision theory  
14 p0247 N77-21663
- Possible pollution and cost analysis from wide use  
of hydrogen fuel in transportation  
14 p0247 N77-21664
- Operation cough drop  
14 p0247 N77-21665
- Hydrogen compatibility of structural materials for  
energy storage and transmission applications  
[SAND-76-8255]  
15 p0395 N77-27553
- Biosolar production of fuels from algae  
[UCRL-52177]  
16 p0511 N77-28323
- Hydrogen-via-electricity: A candidate  
transitional transportation energy system concept  
[ERDA-77-13]  
16 p0514 N77-28596
- Preliminary assessment of economics of hydrogen  
production from Lawrence Livermore Laboratory  
ZnSe thermochemical cycle  
[UCRL-13711]  
16 p0536 N77-31626
- HYDROGENATION**
- Catalytic hydrogenation of solvent-refined lignite  
to liquid fuels  
13 p0008 A77-11243
- Evaluation of coal liquefaction efficiency based  
on various ranks  
13 p0009 A77-11244
- Startup solvent selection for the liquefaction of  
lignite  
13 p0059 A77-16472
- Differential scanning calorimetry studies on coal.  
II - Hydrogenation of coals  
13 p0070 A77-18583
- Deashing of coal liquefaction products via partial  
deasphalting. I - Hydrogen-donor extraction  
effluents. II - Hydrogenation and  
hydroextraction effluents  
14 p0138 A77-20725
- Characteristics of synthetic crude from crude  
shale oil produced by in situ combustion retorting  
14 p0169 A77-23552
- Hydrogasification of oil shale  
14 p0169 A77-23556
- Production of synthetic crude from crude shale oil  
produced by in situ combustion retorting  
14 p0169 A77-23557
- Design studies of the hydrogasification of coal  
14 p0175 A77-24214
- Upgrading coal liquids to gas turbine fuels. III -  
Exploratory process studies  
14 p0178 A77-24853
- Hydrogenation of lignite with synthesis gas  
14 p0201 A77-29525
- Direct production of methane and benzene from coal  
15 p0306 A77-36766
- Fundamentals of coal liquefaction  
15 p0309 A77-36814
- Synthesis and analysis of jet fuel from shale oil  
and coal syncrudes  
[NASA-CR-135112]  
13 p0103 N77-12230
- HYDROGENOLYSIS**
- Nuclear driven water decomposition plant for  
hydrogen production  
13 p0035 A77-12791
- Nonisothermal hydrogen-induced desulfurization of  
coal  
15 p0287 A77-33544
- HYDROGEOLOGY**
- Underground storage of off-peak power  
13 p0027 A77-12728
- Pressure drawdown and buildup analyses in  
geothermal reservoirs  
13 p0030 A77-12753
- Extracting energy from hydraulically-fractured  
geothermal reservoirs  
13 p0030 A77-12757
- Prerequisites for military/civilian geopressured  
geothermal resource development  
13 p0031 A77-12761
- The Los Alamos Scientific Laboratory Dry Hot Rock  
Geothermal Project /LASL Group Q-22/  
14 p0163 A77-23032
- Interaction of hot water reservoirs and deep wells  
14 p0163 A77-23038
- Potential land subsidence at geothermal  
development sites  
15 p0286 A77-33525
- Ground water as energy carrier  
15 p0302 A77-36347
- The question of the utilization of geothermal  
energy in dry rocks /dry walls/  
15 p0303 A77-36348
- An engineering, geological and hydrological  
environmental assessment of a 250 MMSCFD dry ash  
Lurgi coal gasification facility  
16 p0418 A77-43143
- Geothermal energy - Tapping nature's  
boiler room  
16 p0437 A77-47600
- HYDROLYSIS**
- Reactions in the ZnSe thermochemical cycle for  
hydrogen production  
14 p0178 A77-24854
- Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur-families  
15 p0275 A77-33342
- Thermochemical cycles utilizing sulfur for  
hydrogen production from water  
15 p0276 A77-33353
- Flash hydrolysis process for conversion of  
lignite to liquid and gaseous products  
15 p0301 A77-36334
- Enzymatic hydrolysis of cellulosic wastes to  
fermentable sugars for alcohol production  
15 p0315 A77-37666
- Thermodynamics of thermochemical water  
decomposition processes  
14 p0238 N77-21574
- Discovery of reaction sequences for thermochemical  
water splitting  
14 p0238 N77-21575
- A thermochemical data bank for cycle analysis  
14 p0238 N77-21578
- Laboratory investigations on thermochemical  
hydrogen production  
14 p0238 N77-21580
- Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process  
14 p0238 N77-21582
- HYDROMETALLURGY**
- United States special format report: Performance  
of the Sohio Solar Water Heating System using  
large area plastic collectors (Grants, New Mexico)  
[SAN/1038-76/1]  
15 p0365 N77-24606
- HYDROXIDES**
- Storage of solar energy by inorganic  
oxide/hydroxides  
16 p0492 A77-49109
- Experimental test of gas heat transfer system for  
hydroxide heat storage  
[AI-ERDA-13176]  
15 p0381 N77-26655
- HYPERSONIC AIRCRAFT**
- Hypersonic technology-approach to an expanded  
program  
13 p0051 A77-14597
- Layout and flight performance of a hypersonic  
transport /HST/  
[DGLR PAPER 76-198]  
13 p0060 A77-16575
- ICE NUCLEI**
- Atmospheric ice nuclei - No detectable effects  
from a coal-fired powerplant plume  
13 p0054 A77-15780
- ICE PREVENTION**
- Freeze protection for solar collectors  
15 p0303 A77-36350
- ICELAND**
- Geothermal flux through palagonitized tephra,  
Surtsey, Iceland - The Surtsey  
temperature-data-relay experiment via Landsat-1  
13 p0048 A77-13648
- Geothermal power utilization, present and future  
15 p0262 A77-31475
- Utility distribution systems in Iceland  
[AD-A026956]  
13 p0126 N77-14957
- IDAHO**
- Geothermal R and D project report  
[ANCR-1283]  
13 p0124 N77-14605
- Pumped storage potential of the Bell's Canyon area  
[PB-267722/7]  
16 p0539 N77-31664
- IGNITION**
- Hydrogen as a fuel in compression ignition engines  
13 p0071 A77-18932



# SUBJECT INDEX

# INDUCTION MOTORS

- Ignition of droplets of liquid fuels solvent  
extracted from coal 16 p0508 A77-51588
- IGNITION LIMITS**  
Thermal explosion of moving reacting fluids of  
variable viscosity 13 p0052 A77-14980  
Utilization of disposed petroleum products and  
industrial wastes as fuels 14 p0167 A77-23404  
Ignition of flammable gases in crude-oil tankers  
as a result of metal fracture [AD-A027411] 13 p0127 N77-15121
- IGNITION SYSTEMS**  
Performance and NOx emissions modeling of a jet  
ignition prechamber stratified charge engine  
[SAE PAPER 760161] 13 p0016 A77-12150
- ILLINOIS**  
The air quality and economic implications of  
supplementary control systems in Illinois ---  
considering electric power plant fuels  
[PB-255699/1] 13 p0101 N77-11588  
Isotopic characterization of Illinois natural gas  
13 p0113 N77-13484  
Sources of energy data for Illinois  
[PB-262562/2] 15 p0350 N77-22686
- ILLUMINANCE**  
Computational program for accurate  
predetermination of irradiance and illuminance  
in connection with solar energy utilization  
14 p0147 A77-21777
- ILLUMINATING**  
Energy conservation on campus. Volume 2: Case  
studies [PB-266212/0] 16 p0524 N77-29637
- ILLUMINATION**  
Enhancement of diffusion length in RFG ribbon  
solar cells under illumination --- Edge-defined  
Film-fed Grown 16 p0503 A77-50293
- IMAGE RESOLUTION**  
Computing residuals in geothermal research by I.R.  
scanning 16 p0431 A77-46768
- IMMOBILIZATION**  
Progress on the selective removal of H<sub>2</sub>S from  
gasified coal using an immobilized liquid membrane  
15 p0318 A77-38146
- IMPACT RESISTANCE**  
Analysis of ceramic materials for impact members  
in isotopic heat sources [BNI-X-670] 14 p0210 N77-17246  
Crash test of a liquid hydrogen automobile  
14 p0244 N77-21635
- IMPACT TESTS**  
Crash test of a liquid hydrogen automobile  
15 p0282 A77-33397
- IMPERIAL VALLEY (CA)**  
Cost and performance comparison of flash binary  
and steam turbine cycles for the Imperial  
Valley, California --- in geothermal resources  
exploitation 16 p0455 A77-48801  
Energy in an oasis: Geothermal resource  
development in the Imperial Valley of California  
16 p0552 N77-33598
- INCENTIVE TECHNIQUES**  
The financial incentives for the fabrication of  
improved absorption coatings for the flat plate  
collector 16 p0487 A77-49066
- INCENTIVES**  
The effectiveness of solar energy incentives at  
the state and local level [PB-263371/7] 15 p0375 N77-25670
- INCIDENT RADIATION**  
Computation of solar radiation design curves  
13 p0072 A77-19049
- INCINERATORS**  
Solid waste incineration and energy recovery in  
hospitals 15 p0272 A77-33283  
Energy recovery by the incineration of solid waste  
- Development, present status and experiences in  
Germany 15 p0334 A77-39675  
'Co-disposal' for solid wastes and sewage sludge  
16 p0427 A77-45873
- Fluidized-bed incineration of waste materials  
16 p0434 A77-47216  
Modern incineration - A proven way for recovery of  
energy and metals 16 p0434 A77-47220  
Thermal processing of municipal solid waste for  
resource and energy recovery --- Book 16 p0438 A77-47951
- INDEXES (DOCUMENTATION)**  
Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643  
TRISNET. Directory to transportation research  
information resources [PB-255172/9] 13 p0125 N77-14939  
The analysis of subsidence associated with  
geothermal development. Volume 3: Information  
bank [PB-263694/2] 15 p0369 N77-24716  
Program definition for the development of  
geothermal energy. Volume 3: Appendixes  
[NASA-CR-153223] 15 p0371 N77-25614  
Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 1: Digest of detailed data  
base descriptions [UCID-17316-PT-1] 15 p0387 N77-27036  
Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 2: Detailed data base  
descriptions [UCID-17316-PT-2] 15 p0387 N77-27037
- INDIA**  
Tidal power generation in India 15 p0310 A77-36988  
Wind power for India 16 p0423 A77-44498
- INDIUM ALLOYS**  
Solar cell collector and method for producing same  
--- indium alloy coatings [NASA-CASE-LEW-12552-1] 14 p0211 N77-17564
- INDIUM ANTIMONIDES**  
Thin film solar acceptors 13 p0072 A77-19053/
- INDIUM COMPOUNDS**  
Temperature dependence of the 10.6-microns  
reflectivity of ITO-coated silicon --- selective  
absorber for solar energy conversion application  
14 p0200 A77-29246  
Photovoltaic properties of GaSe and InSe junctions  
15 p0289 A77-34117  
MIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective  
coating 16 p0499 A77-49494  
Efficient sprayed In<sub>2</sub>O<sub>3</sub>:Sn n-type silicon  
heterojunction solar cell 16 p0503 A77-50292
- INDIUM PHOSPHIDES**  
High efficiency n-CdS/p-InP solar cells prepared  
by the close-spaced technique 14 p0156 A77-22081  
Preparation of CdS/InP solar cells by chemical  
vapor deposition of CdS 14 p0205 A77-29893  
InP-CdS solar cells 15 p0259 A77-30740  
High-efficiency and high-peak-power InP  
transferred-electron oscillators 15 p0289 A77-34366
- INDIUM SULFIDES**  
A sulfuration process for the preparation of  
photovoltaic Cu<sub>x</sub>S and CuInS<sub>2</sub> thin films  
13 p0076 A77-19087  
CuInS<sub>2</sub> thin-film homojunction solar cells  
16 p0399 A77-40567
- INDONESIA**  
Nuclear power aspects in an oil and coal producing  
country [IAEA-CN-36/175] 16 p0560 N77-33681
- INDUCTANCE**  
A multi-megajoule inertial-inductive energy  
storage system 15 p0299 A77-36292
- INDUCTION MOTORS**  
Internal problem for the end effect in a linear  
asynchronous MHD-machine operating at an  
arbitrary current load 15 p0295 A77-35799

## INDUSTRIAL AREAS

## SUBJECT INDEX

- Predicted and measured finite-width effects in linear induction machines 16 p0413 A77-42628
- Finite length effects in linear induction machines with different iron contours 16 p0413 A77-42629
- INDUSTRIAL AREAS**
- InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 1: National solar demonstration program [COO-2688-76-6-VOL-1] 14 p0224 N77-19632
- INDUSTRIAL ENERGY**
- Energy consumption and conservation in the United States 13 p0005 A77-11028
- Energy use in industry 13 p0005 A77-11029
- Energy and the gas industry 13 p0005 A77-11032
- Methods of energy analysis 13 p0007 A77-11046
- Problems involved in improving the industrial fuel and energy balance 13 p0012 A77-11347
- Industrial energy conservation through integration of thermal energy storage into process energy dynamics 13 p0028 A77-12733
- An advanced energy conservation technology program; Proceedings of the Intersociety Workshop Conference, Airline House, Va., March 24-26, 1976 13 p0045 A77-12928
- The potential for application of energy storage capacity on electric utility systems in the United States. I 13 p0054 A77-15625
- Stationary solar concentrators for industrial heating and cooling 13 p0074 A77-19069
- The two enemies of industrial development of solar energy - Simplicity and economy 13 p0078 A77-19109
- 100 MW large industrial gas turbine 14 p0155 A77-22022
- Solar energy for the Australian food processing industry 14 p0181 A77-25900
- Recent tests of industrial gas turbine combustors fueled with simulated low heating value coal gas [ASME PAPER 76-WA/GT-3] 14 p0185 A77-26459
- A new 10,000-hp gas turbine engine for industrial service [ASME PAPER 77-GT-4] 14 p0197 A77-28524
- Ways of improving fuel utilization in industry 15 p0265 A77-31935
- Industry can save energy without stunting its growth 15 p0267 A77-32209
- Hydrogen in the seaward advancement of industrial societies --- offshore energy production 15 p0285 A77-33417
- The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496
- Cut energy costs: A guide for buying and plant operation --- industrial energy saving techniques 15 p0290 A77-34642
- Technology and economics of industrial fuel gas from coal 15 p0302 A77-36342
- The economics of industrial process heat from solar energy 15 p0302 A77-36345
- Technical and economic aspects of industrial power-heat coupling. I 15 p0334 A77-39674
- Energy conservation by symbiosis 16 p0408 A77-41852
- The industrial gas turbine - Its status and prospects 16 p0429 A77-46408
- A new maintenance concept applied in the design of a new industrial gas turbine in the 100 MW class 16 p0429 A77-46410
- ERDA/P&WA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology 16 p0446 A77-48721
- Energy savings through on-site fuel cells in industrial applications 16 p0449 A77-48752
- Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications 16 p0450 A77-48756
- Fluidized bed adiabatic combustor power plants - Concepts and comparisons 16 p0453 A77-48784
- The solid-fuel gas turbine for industrial energy production 16 p0453 A77-48785
- ERDA Solar Thermal Energy Program for industrial process heat 16 p0470 A77-48922
- Survey of the applications of solar thermal energy to industrial process heat 16 p0481 A77-49019
- Solar energy for process heat 16 p0481 A77-49020
- Shallow solar ponds for industrial process heat - The ERDA-Sohio project 16 p0482 A77-49024
- A generalized numerical model for predicting energy transfers and performance of large solar ponds 16 p0482 A77-49025
- Solar industrial steam 16 p0482 A77-49029
- General Electric prepares the LM5000 for testing 16 p0505 A77-51169
- Energy use in the contract construction industry [PB-245422/1] 13 p0099 N77-11557
- A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries 13 p0115 N77-13542
- A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255659/7] 13 p0115 N77-13543
- Industrial process heat from shallow solar ponds [UCRL-77801] 13 p0124 N77-14611
- The intersectoral feedback model [PB-255859/1] 13 p0125 N77-14950
- Net energy analysis: An energy balance study of fossil fuel resources [PB-259158/4] 14 p0225 N77-19657
- Solar industrial steam [UCRL-77895] 14 p0231 N77-20592
- Site energy handbook. Volume 2: Forms for energy survey and appraisal [ERDA-76-131/2] 15 p0355 N77-23608
- Survey of emissions control and combustion equipment data in industrial process heating [PB-263453/3] 15 p0368 N77-24674
- Environmental considerations of selected energy conserving manufacturing process options. Volume 4: Petroleum refining industry report [PB-264270/0] 15 p0384 N77-26681
- Environmental considerations of selected energy conserving manufacturing process options. Volume 5: Pulp and paper industry report [PB-264271/8] 15 p0384 N77-26682
- Environmental considerations of selected energy conserving manufacturing process options. Volume 6: Olefins industry report [PB-264272/6] 15 p0384 N77-26683
- Environmental considerations of selected energy conserving manufacturing process options. Volume 7: Ammonia industry report [PB-264273/4] 15 p0384 N77-26684
- Environmental considerations of selected energy conserving manufacturing process options. Volume 8: Alumina/aluminum industry report [PB-264274/2] 15 p0384 N77-26685
- Environmental considerations of selected energy conserving manufacturing process options. Volume 9: Textile industry report [PB-264275/9] 15 p0384 N77-26686
- Environmental considerations of selected energy conserving manufacturing process options. Volume 10: Cement industry report [PB-264276/7] 15 p0384 N77-26687
- Environmental considerations of selected energy conserving manufacturing process options. Volume 11: Glass industry [PB-264277/5] 15 p0384 N77-26688

## SUBJECT INDEX

## INDUSTRIES

- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 N77-26690
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 14: Primary copper industry report  
[PB-264280/9] 15 p0385 N77-26691
- Environmental considerations of selected energy conserving manufacturing process options.  
Volume 15: Fertilizer industry report  
[PB-264281/7] 15 p0385 N77-26692
- Utilization of low and intermediate BTU gas from coal for iron ore pelletizing  
[PB-264702/2] 15 p0389 N77-27247
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California  
[UCRL-52180] 16 p0536 N77-31628
- Europe's changing energy relations  
[R-2086-ISA] 16 p0553 N77-33610
- INDUSTRIAL MANAGEMENT**
- Electric load management and energy conservation  
14 p0137 A77-20685
- Alternatives to oil and gas through energy management  
[AIAA 77-1006] 16 p0403 A77-41553
- Solar collector manufacturing activity, January-June 1976  
[PB-258865/5] 14 p0208 N77-16455
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities)  
[PB-261150/7] 15 p0346 N77-22644
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement  
[PB-261153/1] 15 p0346 N77-22645
- INDUSTRIAL PLANTS**
- Compilation of an inventory for particulate emissions in Belgium  
13 p0009 A77-11271
- Water requirements for an integrated SNG plant and mine operation  
13 p0060 A77-16651
- Superalloys for advanced energy systems  
13 p0061 A77-16824
- All-round technical and economic investigations of open-cycle industrial MHC generator channels and superconducting magnet systems  
14 p0142 A77-21266
- Environmental aspects of coal conversion plant siting and cost of pollution control  
14 p0192 A77-27293
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks  
15 p0278 A77-33365
- Technologies lead to conservation --- in munition plants  
15 p0305 A77-36634
- Designing gas turbines for the industrial and marine field  
16 p0429 A77-46404
- Stimulation of the solar industry by way of the Federal Buildings Program  
16 p0462 A77-48850
- Preliminary research on Ocean Energy Industrial Complexes  
16 p0484 A77-49042
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report  
[PB-257444/0] 13 p0116 N77-13554
- Characterization and evaluation of wastewater sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976  
[PB-255586/0] 13 p0116 N77-13566
- Techniques for the analysis of total energy and labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- Technoeconomic analysis of large scale thermonuclear production of hydrogen  
[EPRI-EM-287] 16 p0532 N77-31336
- Study of gasoline vapor emission controls at small bulk plants  
[PB-267096/6] 16 p0549 N77-32638
- INDUSTRIAL SAFETY**
- Laws and regulations affecting coal with summaries of Federal, State, and local laws and regulations pertaining to air and water pollution control, reclamation, diligence and health and safety, part 1  
[PB-255927/6] 13 p0110 N77-12592
- Occupational radiation exposure at light water cooled power reactors, 1969-1975  
[PB-257054/7] 13 p0125 N77-14740
- INDUSTRIAL WASTES**
- Energy from wastes  
13 p0006 A77-11038
- Clean air protection and industrial development  
13 p0010 A77-11303
- Atmospheric ice nuclei - No detectable effects from a coal-fired powerplant plume  
13 p0054 A77-15780
- Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer  
13 p0062 A77-17541
- Utilization of disposed petroleum products and industrial wastes as fuels  
14 p0167 A77-23404
- Waste economy and recycling: Problems and practice --- German book  
15 p0273 A77-33303
- Energy recovery from low heating value industrial waste  
15 p0292 A77-35160
- State of the art of particulate and SO2 removal on coal fired boilers  
15 p0293 A77-35167
- Energy recovery from municipal and industrial waste  
15 p0305 A77-36605
- Disposal of toxic wastes. I - Electroplating and electrochemical machining wastes. II - Poisonous and radioactive wastes  
15 p0305 A77-36608
- Strategy of pollution control --- Book  
16 p0400 A77-40673
- 600 kW Organic Rankine Cycle Waste Heat Power Conversion System  
16 p0459 A77-48829
- Compilation of air pollutant emission factors. Supplement  
[PB-254274/4] 13 p0093 N77-10731
- Selected aspects of waste heat management  
[PB-254401/3] 13 p0109 N77-12568
- Characterization and evaluation of wastewater sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976  
[PB-255586/0] 13 p0116 N77-13566
- Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges  
[PB-256691/7] 13 p0133 N77-15540
- Control of oxides of sulfur from stationary sources in the south coast air basin of California  
[PB-261754/6] 15 p0348 N77-22668
- Environmental assessment sampling and analytical strategy program --- industrial wastes  
[PB-261259/6] 15 p0352 N77-23021
- Energy requirements for air pollution control in the primary aluminum industry  
[PB-264483/9] 15 p0375 N77-25684
- Characterization of substances in products effluents and wastes from synthetic fuel production tests  
[BNWL-2131] 16 p0540 N77-31675
- Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation  
[PB-268232/6] 16 p0542 N77-32051
- Energy and protein production from pulp mill wastes  
[COO-2983-2] 16 p0557 N77-33645
- INDUSTRIES**
- User's guide to petroleum industry survey data type  
[PB-256635/4] 13 p0098 N77-11544

- Energy use in the contract construction industry.  
Appendix A: Study methodology  
[PB-245423/9] 13 p0099 N77-11558
- Energy use in the contract construction industry.  
Appendix B: Assessment of construction  
equipment availability, energy requirements, and  
construction industry capacity to support  
Project Independence  
[PB-245424/7] 13 p0100 N77-11559
- Preliminary research on ocean energy industrial  
complexes, phase 1  
[ORO-4915-3] 14 p0248 N77-21669
- Impact of alternate fuels on industrial  
refractories and refractory insulation  
applications: An assessment  
[ORNL-TM-5592] 15 p0344 N77-22618
- Technology transfer from foreign direct investment  
in the United States. Report of a seminar series  
[PB-263012/7] 15 p0358 N77-24018
- Process energy reliability requirements for  
selected industries  
[ORNL-TM-5428] 15 p0364 N77-24594
- RANN utilization experience (case studies 32  
through 41) --- research applied to national needs  
[PB-263683/5] 15 p0370 N77-25027
- Choosing an electrical energy future for the  
Pacific northwest: An alternative scenario  
[PB-264048/0] 15 p0375 N77-25674
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 2: Industry priority report  
[PB-264268/4] 15 p0383 N77-26679
- Environmental considerations of selected energy  
conserving manufacturing process options.  
Volume 3: Iron and steel industry report  
[PB-264269/2] 15 p0384 N77-26680
- Structural reform in the electric power industry  
[PB-264589/3] 15 p0389 N77-27316
- Energy industry investigation. Part 1: Joint  
ventures  
[GPO-72-530] 15 p0391 N77-27499
- Energy industry investigation. Part 2: Industry  
structure  
[GPO-83-695] 15 p0391 N77-27500
- Quarterly report to US House and Senate Committees  
on Appropriations (3rd)  
[PB-265490/3] 16 p0517 N77-28616
- Research and development in enhanced oil recovery.  
Part 1: Overview  
[ERDA-77-20/1] 16 p0537 N77-31637
- Survey of the applications of solar thermal energy  
systems to industrial process heat. Volume 3:  
Solar thermal energy systems analysis and  
preliminary assessment of related nontechnical  
issues  
[TID-27348-VOL-3] 16 p0537 N77-31638
- Survey of the applications of solar thermal energy  
systems to industrial process heat. Volume 2:  
Industrial process heat survey  
[TID-27348-VOL-2] 16 p0537 N77-31639
- INERTIA**
- Construction and interpretation of a digital  
inertia image --- of Fisgah Crater and Lavic  
Lake in Southern California  
16 p0421 A77-44464
- INERTIA PRINCIPLE**
- A multi-megajoule inertial-inductive energy  
storage system  
15 p0299 A77-36292
- INERTIAL FUSION (REACTOR)**
- Advanced fuel nuclear reaction feasibility using  
laser compression. I  
16 p0435 A77-47358
- Advanced fuel nuclear reaction feasibility using  
laser compression. II  
16 p0435 A77-47359
- INFLATABLE STRUCTURES**
- An inflatable solar concentrator for a high  
temperature storage system  
13 p0074 A77-19064
- INFORMATION DISSEMINATION**
- Energy interrelationships. A handbook of tables  
and conversions factors for combining and  
comparing international energy data  
[PB-269034/5] 16 p0559 N77-33675
- INFORMATION MANAGEMENT**
- Energy information activities at the FEA  
[PB-253562/5] 13 p0099 N77-11553
- Analysis of information systems for hydropower  
operations  
[NASA-CR-149373] 13 p0129 N77-15497
- INFORMATION RETRIEVAL**
- Bibliography on solar cells  
14 p0195 A77-28067
- Federal energy information gathering activities:  
A report to the President of the United States,  
and the Energy Resources Council  
[PB-262844/4] 15 p0374 N77-25668
- INFORMATION SYSTEMS**
- Energy information activities at the FEA  
[PB-253962/5] 13 p0099 N77-11553
- Analysis of information systems for hydropower  
operations: Executive summary  
[NASA-CR-149342] 13 p0122 N77-14586
- TRANSNET. Directory to transportation research  
information resources  
[PB-255172/9] 13 p0125 N77-14939
- ERDA Interlaboratory Work for Data Exchange (IWGDE)  
[LBL-5329] 15 p0352 N77-22998
- Development and applications of spatial data  
resources in energy related assessment and  
planning  
[CONF-761017-1] 15 p0355 N77-23609
- Factors in the planning of a national information  
system for renewable energy  
[PB-262003/7] 15 p0358 N77-24002
- Planner's energy workbook: A users' manual for  
land use and energy utilization  
[BNL-21546] 15 p0364 N77-24596
- Federal energy information locator system: Energy  
information in the federal government  
[PB-262331/2] 16 p0539 N77-31661
- INFRARED DETECTORS**
- Environmental protection measuring technique.  
Sensor for automatic continuous emission control  
of gases  
[BNFT-PB-T-76-03] 14 p0209 N77-16467
- INFRARED REFLECTION**
- Waveguide high pass filter for thermal conversion  
of solar energy  
13 p0073 A77-19054
- Temperature dependence of the 10.6-microns  
reflectivity of ITO-coated silicon --- selective  
absorber for solar energy conversion application  
14 p0200 A77-29246
- Selective behavior and selective layer deposition  
in the case of light-transparent covers --- for  
solar collectors  
14 p0202 A77-29564
- Wavelength-selective surfaces for solar energy  
utilization  
14 p0204 A77-29583
- Heat mirrored solar energy receivers  
[AIAA PAPER 77-728] 15 p0324 A77-39506
- The geometry of catoptric light. II - An  
application to solar energy  
16 p0417 A77-42959
- Processing on high efficiency solar collector  
coatings  
16 p0526 N77-30286
- INFRARED SCANNERS**
- Computing residuals in geothermal research by I.B.  
scanning  
16 p0431 A77-46768
- Detecting structural heat losses with mobile  
infrared thermography. Part 4: Estimating  
quantitative heat loss at Dartmouth College,  
Hanover, New Hampshire  
[AD-A031803] 14 p0228 N77-20393
- INFRARED SPECTRA**
- Infrared extinction spectra of some common liquid  
aerosols  
15 p0290 A77-34561
- Classification of oils by the application of  
pattern recognition techniques to infrared spectra  
[AD-A039387] 16 p0531 N77-30841
- INGOTS**
- Thermal energy storage using large hollow steel  
ingots  
16 p0492 A77-49106
- INHIBITORS**
- Inhibited ethylene glycol as the solar nexus  
15 p0270 A77-32601
- INJECTORS**
- The 120-keV beam direct conversion system for TFTR  
injectors  
[UCRL-52137] 15 p0355 N77-23610

## SUBJECT INDEX

## INTERNAL COMBUSTION ENGINES

## INLET FLOW

Molecular gas performance of a disk generator with swirl 15 p0326 A77-39534

## INORGANIC COATINGS

Investigation of high temperature performance of thin film, solar-thermal energy converters [PB-265554/6] 16 p0516 N77-28613

## INORGANIC COMPOUNDS

Storage of solar energy by inorganic oxide/hydroxides 16 p0492 A77-49109

Molten salt thermal energy storage systems: Salt selection [COO-2888-1] 15 p0365 N77-24609

Research on electrochemical energy conversion systems [AD-A034454] 15 p0367 N77-24632

## INORGANIC MATERIALS

Industrial development in zero-G 15 p0295 A77-35812

Inorganic phase change materials for energy storage in solar thermal program 16 p0492 A77-49103

## INORGANIC SULFIDES

Development status of lithium-silicon/iron sulfide load leveling batteries 16 p0448 A77-48741

Improved negative electrodes for lithium/iron sulfide batteries 16 p0448 A77-48742

## INPUT/OUTPUT ROUTINES

The intersectoral feedback model [PB-255859/1] 13 p0125 N77-14950

Energy input-output modelling: Problems and prospects [PB-261925/2] 15 p0349 N77-22679

## INSOLATION

Calculation of the radiation entering a 'hot box' type solar set-up 13 p0051 A77-14581

Survey of quantitative data on the solar energy and its spectra distribution 13 p0072 A77-19044

Autonomous station for the acquisition and concentration of heliometric data 13 p0072 A77-19046

An automatic solar disk tracking system for incident energy measurements 14 p0138 A77-20749

A mathematical model for the digital computation of the hours of sunshine on an inclined plane 14 p0166 A77-23382

Calculation of radiation entering 'hot box' solar unit 15 p0291 A77-34975

A solar flux density calculation for a solar tower concentrator using a two-dimensional Hermite function expansion 16 p0405 A77-41578

Calculation of monthly average insolation on tilted surfaces 16 p0422 A77-44476

Validity of the isotropic-distribution approximation in solar energy estimations 16 p0422 A77-44477

Autocorrelation and stochastic modelling of insolation sequences --- for solar thermal systems 16 p0422 A77-44479

Correlation equation for hourly diffuse radiation on a horizontal surface --- insolation on solar collectors 16 p0422 A77-44481

Experience in constructing a solar energy cadastral survey 16 p0443 A77-48525

Deterministic insolation estimates for solar total energy systems 16 p0462 A77-48847

Insolation data for solar energy conversion derived from satellite measurements of earth radiance 16 p0471 A77-48930

Experimental and theoretical studies on solar energy for energy conversion 16 p0471 A77-48932

Methods for estimating total flux in the direct solar beam at any time 16 p0471 A77-48934

Insolation and temperature statistics and their influence on the design of solar heating systems and the electric utility interface 16 p0479 A77-49000

The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation 16 p0501 A77-50206

The solar spectrum at typical clear weather days --- for optimal energy conversion cell performance 16 p0501 A77-50212

Solar energy and the residence - Some systems aspects 16 p0502 A77-50213

The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors 16 p0502 A77-50214

Precision insolation measurement under field conditions 14 p0219 N77-19113

Regional variations of solar radiation with application to solar energy system design, user's manual [PB-259378/8] 14 p0234 N77-20676

Instrumentation for measuring direct and diffuse insolation in testing thermal collectors [CONF-760832-23] 15 p0394 N77-27545

## INSTITUTIONS

Some institutional problems of residential solar heating 16 p0495 A77-49130

Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131

## INSTRUMENT COMPENSATION

Accelerated response of thermopile pyranometers 13 p0019 A77-12405

## INSTRUMENT ERRORS

A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 15 p0283 A77-33407

## INSULATION

Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638

Development and characterization of materials for open cycle MHD [BNWL-2004-3] 16 p0541 N77-31969

## INTERFACIAL TENSION

Interfacial effects in the recovery of residual oil by displacement: Studies at Northwestern University [COO-0019-5] 13 p0122 N77-14595

## INTERMETALLICS

Intermetallic compounds - Background and results of twenty years of research 13 p0014 A77-11600

Some useful relationships between the physical and thermodynamic properties of metal hydrides 13 p0033 A77-12776

Hydrogen storage by binary and ternary intermetallics for energy applications: A review [UCRL-52110] 15 p0394 N77-27548

## INTERNAL COMBUSTION ENGINES

Performance and NOx emissions modeling of a jet ignition prechamber stratified charge engine [SAE PAPER 760161] 13 p0016 A77-12150

Onboard hydrogen generation for automobiles 13 p0020 A77-12663

Application of a shunt motor and a 2 cylinder gasoline engine as a hybrid drive for an automobile 13 p0025 A77-12703

Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708

A guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines 13 p0033 A77-12779

A comparison between the primary energy consumption of electric and gasoline powered vehicles 14 p0159 A77-22885

Water induction in hydrogen-powered IC engines 14 p0171 A77-23721

## INTERNAL CONVERSION

## SUBJECT INDEX

- Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases 14 p0195 A77-28050
- Dynamic tests of hydrogen-powered IC engines 15 p0282 A77-33395
- Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396
- A hydrogen-powered mass transit system 15 p0282 A77-33400
- Use of hydrogen in automotive engines 15 p0283 A77-33401
- Running out of steam. III --- alternatives to internal combustion engine 15 p0310 A77-36984
- New developments on VW-FCI and VW-PCV stratified charge engine concepts --- Pre-Chamber-Injection and Pre-Chamber-Valve combustion processes 16 p0401 A77-41257
- Hybrid drive with kinetic energy store as vehicle drive [UCRL-TRANS-11018] 13 p0120 N77-14486
- Research plan for achieving reduced automotive energy consumption [PB-255929/2] 13 p0121 N77-14495
- Hydrogen storage on highway vehicles: Update 1976 14 p0242 N77-21614
- Automotive fuel saving system with on-board hydrogen generation and injection into IC engines 14 p0242 N77-21618
- Water induction in hydrogen-powered IC engines 14 p0243 N77-21631
- Dynamic tests of hydrogen-powered IC engines --- for mass transit vehicles 14 p0244 N77-21633
- Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 N77-21634
- Prototype hydrogen automobile using a metal hydride 14 p0244 N77-21636
- A hydrogen-powered mass transit system 14 p0244 N77-21638
- Use of hydrogen in automotive engines 14 p0244 N77-21639
- Performance of Army engines with unleaded gasoline-field study evaluation [AD-A032075] 15 p0342 N77-22490
- Fuel consumption, emissions, and power characteristics of the 1975 Ford 140-CID automotive engine, experimental data [PB-261771/0] 15 N77-22725
- Combustion research at Sandia Laboratories [SAND-76-8511] 15 p0377 N77-26253
- Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines [TREE-1036] 16 p0511 N77-28324
- Feasibility test on compounding the internal combustion engine for automotive vehicles, task 2 [COO-2690-1] 16 p0512 N77-28495
- INTERNAL CONVERSION**
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 14 p0245 N77-21647
- INTERNATIONAL COOPERATION**
- The future of air transportation - Economic association considerations [AIAA PAPER 77-286] 13 p0065 A77-18222
- Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility 14 p0139 A77-21215
- International cooperation on development of hydrogen technologies 14 p0171 A77-23717
- A small but important contribution to the German-American solar research programme 'Helios' 15 p0323 A77-39125
- The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility 15 p0327 A77-39540
- Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132
- Program plan for ERDA's participation in the IEA working party on energy conservation research and development [ERDA-77-57] 16 p0557 N77-33648
- INTERNATIONAL LAW**
- National Meeting on Air and Space Law, 7th, Universidad Nacional de Cordoba, Cordoba and La Falda, Argentina, August 13-16, 1975, Proceedings 13 p0053 A77-15050
- INTERNATIONAL RELATIONS**
- Trends in world oil prices and production [PB-268411/6] 16 p0547 N77-32607
- INTERNATIONAL TRADE**
- OPEC and the monopoly price of world oil (World Oil Project) 16 p0518 N77-29001
- Europe's changing energy relations [R-2086-ISA] 16 p0553 N77-33610
- INTERPLANETARY SPACECRAFT**
- A new cycle for optimum energy storage in interplanetary missions [IAF PAPER 77-141] 16 p0507 A77-51444
- INTERPLANETARY TRANSFER ORBITS**
- Energy storage in orbital and interplanetary missions [DGLR PAPER 76-189] 13 p0059 A77-16551
- INTERRUPTION**
- Repetitive series Interrupter II [AD-A035267] 15 p0371 N77-25447
- INVENTORIES**
- Trends in power plant capacity and utilization. Inventory of power plants in the United States [PB-264451/6] 15 p0373 N77-25655
- INVENTORY MANAGEMENT**
- A screening for potentially critical materials for the National stockpile [PB-267214/5] 16 p0533 N77-31595
- INVERTEBRATES**
- Effects of thermal pollution on certain aquatic invertebrates [PB-263488/9] 15 p0368 N77-24673
- INVERTED CONVERTERS (DC TO AC)**
- Windmills stage a comeback --- review 13 p0048 A77-13624
- Some results of an investigation with the U-25 experimental-industrial facility, aimed at raising its parameters to the design level --- MHD generator energy converter 14 p0136 A77-20105
- INVERTERS**
- Curve of current delivered from MHD generator to a conventional power grid by inverter system 14 p0141 A77-21253
- Hybrid simulation of fuel cell power conversion systems 16 p0414 A77-42636
- INVESTMENTS**
- Daedalophobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada 16 p0494 A77-49121
- Investment planning in the energy sector [LBL-4474] 13 p0125 N77-14948
- Operation cough drop 14 p0247 N77-21665
- Technology transfer from foreign direct investment in the United States. Report of a seminar series [PB-263012/7] 15 p0358 N77-24018
- ION ACCELERATORS**
- Systems analysis of accelerator and storage ring systems for inertial fusion 15 p0334 A77-39744
- ION BEAMS**
- Ignition of a pulsed thermonuclear reaction by high-current ion beams 14 p0164 A77-23106
- Design considerations for a migma advanced fuel fusion reactor 15 p0334 A77-39747
- Solar array maximum power tracking with closed-loop control of a 30-centimeter ion thruster [NASA-TN-X-73643] 15 p0376 N77-26222
- ION CURRENTS**
- Electric power fluctuations in a MHD generator 15 p0269 A77-32432
- ION DISTRIBUTION**
- Methods of 'tailoring' ion distributions in phase space /'morphodynamics'/ --- in Migma-type fusion reactors 16 p0436 A77-47364

## ION ENGINES

- UK, T5 ion engine thrust vector control considerations  
[ATAA PAPER 76-1064] 13 p0045 A77-13030  
Advanced fuel fusion application to manned space propulsion 16 p0436 A77-47367

## ION IMPLANTATION

- Silicon solar cells by high-speed low-temperature processing 15 p0258 A77-30728  
Low energy production processes in manufacturing of silicon solar cells 16 p0486 A77-49055

## ION SOURCES

- Update on the development of 120-keV multi-megawatt neutral beam source 15 p0335 A77-39749

## IONIC MOBILITY

- Practical reasons for investigating ion transport in high temperature insulating materials --- for energy conversion efficiency [CONF-760831-2] 14 p0227 A77-19935

## IONIZATION

- Field ionization for laser isotope separation [EPRI-NP-334] 16 p0552 A77-33512

## IONOSPHERIC DISTURBANCES

- Optimizing a low cost satellite energy system 16 p0465 A77-48877

## IONOSPHERIC HEATING

- Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere 16 p0464 A77-48875

## IRAN

- Prospects for solar energy utilization in Iran - Photothermal methods 13 p0013 A77-11532

## IRELAND

- Domestic hot water and solar energy in Ireland 16 p0430 A77-46608

## IRON

- Finite length effects in linear induction machines with different iron contours 16 p0413 A77-42629  
Environmental considerations of selected energy conserving manufacturing process options. Volume 3: Iron and steel industry report [PB-264269/2] 15 p0384 A77-26680

## IRON ALLOYS

- Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777  
Hydrogen storage via iron-titanium for a 26 MW/e/peaking electric plant 13 p0048 A77-13543

## IRON CHLORIDES

- Experimental demonstration of an iron chloride thermochemical cycle for hydrogen production 13 p0032 A77-12772  
Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351

## IRON COMPOUNDS

- Development of compact lithium/iron disulfide electrochemical cells 13 p0026 A77-12715  
The behavior of iron titanium hydride test beds - Long-term effects, heat transfer and modeling 15 p0280 A77-33386  
On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells 16 p0425 A77-45151  
Development status of lithium-silicon/iron sulfide load leveling batteries 16 p0448 A77-48741  
Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families 14 p0238 A77-21572  
Physical metallurgy of FeTi-hydride and its behavior in a hydrogen storage container 14 p0242 A77-21620  
The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling 14 p0242 A77-21621

## IRON ORES

- Utilization of low and intermediate BTU gas from coal for iron ore pelletizing [PB-264702/2] 15 p0389 A77-27247

## IRON OXIDES

- Desulfurization of flue gases with iron/III/ oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions --- German book 13 p0080 A77-19184  
Photoelectrolysis with  $\text{FeO}_3$  electrodes --- water splitting using solar energy 16 p0399 A77-40553

## IRRADIANCE

- Computational program for accurate predetermination of irradiance and illuminance in connection with solar energy utilization 14 p0147 A77-21777  
Experimental and theoretical studies on solar energy for energy conversion 16 p0471 A77-48932  
The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation 16 p0501 A77-50206

## IRREVERSIBLE PROCESSES

- Irreversibilities, heat penalties, and economics for the methanol/sulfuric acid process --- for hydrogen production 16 p0457 A77-48814  
Irreversibilities in thermochemical cycles for hydrogen production by water decomposition 16 p0457 A77-48816

## IRRIGATION

- Solar water pump for lift irrigation 13 p0019 A77-12406  
Turntable solar arrays 16 p0483 A77-49033  
Beneficial uses of geothermal energy description and preliminary results for phase 1 of the Raft River irrigation experiment [TREE-1048] 16 p0547 A77-32609

## ISLANDS

- Numerical solutions for steady free convection in island geothermal reservoirs 14 p0174 A77-24205

## ISOCYANATES

- Fabrication of solar energy concentrators based on polyurethane foams using new polyol and isocyanate compounds 15 p0271 A77-32973

## ISOMERIZATION

- The use of functionalized polymers as photosensitizers in an energy storage reaction 16 p0501 A77-50208

## ISOTHERMAL LAYERS

- Isothermal surface in a radiation field --- in solar thermal energy devices 13 p0014 A77-11918

## ISOTHERMAL PROCESSES

- An isothermal etchback-regrowth method for high-efficiency Ga/1-x/Al/x/As-GaAs solar cells 15 p0257 A77-30372

## ISOTOPE EFFECT

- Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497  
Locating interesting geothermal areas in the Tuscany region /Italy/ by geochemical and isotopic methods 13 p0013 A77-11498

## ISOTOPE SEPARATION

- Study of a solar assisted diffusion separation process for isotopic mixtures 16 p0483 A77-49030  
Energy and technology review [UCID-52000-76-2] 13 p0131 A77-15508  
Field ionization for laser isotope separation [EPRI-NP-334] 16 p0552 A77-33512

## ISOTOPES

- Combined studies of the sun and isotope ecology 15 p0271 A77-32868

## ITALY

- Remote sensing of geothermic activities of the volcanoes Aetna, Stromboli and Vesuv by means of infra-red NOAA-VHRR-satellite data --- Italy 13 p0104 A77-12485

Trends in refinery capacity and utilization:  
Petroleum refineries in the United States;  
foreign refinery exporting centers  
[PB-256966/3] 13 p0132 N77-15523

## J

## JAPAN

Studies on the energy system of Hokkaido. I -  
First attempt: Model-I. II - Various data and  
their basis. III - Simulations by Model-I  
15 p0287 A77-33526

## JET AIRCRAFT

A simplified method in flight test techniques for  
the determination of the range performance of  
jet aircraft 13 p0060 A77-16600  
Fuel consumption of civil jet transport aircraft  
13 p0062 A77-17234  
Best-range flight conditions for cruise-climb  
flight of a jet aircraft 13 p0085 N77-10379  
The intermittent jet for supersonic conditions  
increased with passage to operating in a ramjet  
- A low cost engine 15 p0339 N77-22130

## JET ENGINE FUELS

A preliminary engineering assessment of jet fuel  
production from domestic coal and shale derived  
oils 13 p0023 A77-12690  
Jet fuel quality considerations 15 p0272 A77-33273  
A study of the efficiency of hydrogen liquefaction  
--- jet aircraft applications 15 p0279 A77-33377  
The military utility of very large airplanes and  
alternative fuels 16 p0434 A77-47271  
Alternate fuels for future aircraft 16 p0444 A77-48709  
An exploratory study to determine the integrated  
technological air transportation system ground  
requirements of liquid-hydrogen-fueled subsonic,  
long-haul civil air transports [NASA-CR-2699]  
13 p0083 N77-10033  
National petroleum product supply and demand, 1976  
- 1978 [PB-254969/9] 13 p0084 N77-10224  
Synthesis and analysis of jet fuel from shale oil  
and coal syncrudes [NASA-CR-135112] 13 p0103 N77-12230  
Some cost, energy, environmental, and resource  
implications of synthetic fuels produced from  
coal for military aircraft [AD-A026667] 13 p0118 N77-14271  
Impact of fuel properties on jet fuel availability  
[AD-A029493] 14 p0219 N77-19278  
A study of the efficiency of hydrogen liquefaction  
14 p0240 N77-21611  
Performance characteristics of turbo-rockets and  
turbo-ramjets using high energy fuel 15 p0339 N77-22131  
Petroleum market shares - A report on sales of  
refined petroleum products, 1972 through 1975:  
Aviation gasoline, jet fuels, middle distillate  
fuel oils, residual fuel oil, motor gasoline  
[PB-262726/3] 15 p0360 N77-24321  
Thermal stability of some aircraft turbine fuels  
derived from oil shale and coal [NASA-TN-X-3551] 15 p0370 N77-25345  
Effect of nitrogenous bases on the thermal  
stability of jet fuels [NASA-TN-75131] 15 p0388 N77-27243  
The potential role of technological modifications  
and alternative fuels in alleviating Air Force  
energy problems [AD-A039597] 16 p0525 N77-30261  
An evaluation of very large airplanes and  
alternative fuels [AD-A040532] 16 p0532 N77-31334  
An evaluation of very large airplanes and  
alternative fuels: Executive summary [AD-A042112] 16 p0550 N77-33154

**JET ENGINES**  
Effect of ceramic coating of JT8D combustor liner  
on maximum liner temperatures and other  
combustor performance parameters [NASA-TN-X-73581] 13 p0126 N77-15037

The pros and cons of variable geometry turbines  
15 p0340 N77-22140

## JET FLAPS

Static and wind-on tests of an upper-surface-blown  
jet-flap nozzle arrangement for use on the Quiet  
Clean Short-haul Experimental Engine (QCSEE)  
[NASA-TN-D-8476] 15 p0370 N77-25086

## JET FLOW

Performance and NOx emissions modeling of a jet  
ignition prechamber stratified charge engine  
[SAB PAPER 760161] 13 p0016 A77-12150  
The influence of the Reynolds number on the  
profiles of velocity and concentration in free  
jets of different density 13 p0069 A77-18500

## JET PUMPS

Development of a jet pump-assisted arterial heat  
pipe [NASA-CR-152015] 16 p0527 N77-30415

## JET THRUST

Development of a small, low cost turbojet engine  
with thrust augmentation --- for RPV 16 p0434 A77-47347

## JP-4 JET FUEL

The impact of JP-4/JP-8 conversion on aircraft  
engine exhaust emissions [AD-A026546] 13 p0112 N77-13234  
JP-4 and JP-9 fuel toxicity studies using water  
fish and aufwuchs [AD-A027594] 13 p0127 N77-15213  
Evaluation of methods to produce aviation turbine  
fuels from synthetic crude oils, phase 2, volume 2  
[AD-A036190] 16 p0511 N77-28325

## JP-5 JET FUEL

Electrostatic properties of JP-5 jet fuel from  
alternate sources [AD-A025684] 13 p0103 N77-12232  
Evaluation of a JP-5 type fuel derived from oil  
shale [AD-A025417] 13 p0112 N77-13231  
Development of high stability fuel. Executive  
summary [AD-A039977] 16 p0533 N77-31339

## JP-8 JET FUEL

The impact of JP-4/JP-8 conversion on aircraft  
engine exhaust emissions [AD-A026546] 13 p0112 N77-13234

## JUNCTION DIODES

Spectral response of a laterally illuminated p-n  
junction --- as photodetector or photovoltaic  
energy converter 13 p0062 A77-17478

## K

## KANSAS

Assessment of fuel-conservation potential of a  
ground-transportation system due to full  
utilization of its mass transportation  
capabilities [PB-262125/8] 15 p0347 N77-22657

## KAPTON (TRADEMARK)

Use of Lexan and Kapton honeycombs to increase  
solar collector efficiency 13 p0068 A77-18448

## KENTUCKY

Strategic petroleum reserve draft environmental  
impact statement for Central Rock Mine  
[PB-262390/8] 15 p0362 N77-24572

## KEROGEN

Thermal alteration of young kerosene in relation to  
petroleum genesis 13 p0053 A77-15044  
Development of the modified in situ oil-shale  
process 14 p0193 A77-27342  
Soluble-salt processes for in-situ recovery of  
hydrocarbons from oil shale 16 p0441 A77-48412

## KEROSENE

Evaluation of a JP-5 type fuel derived from oil  
shale [AD-A025417] 13 p0112 N77-13231  
Impact of fuel properties on jet fuel availability  
[AD-A029493] 14 p0219 N77-19278



**KINETIC ENERGY**

Superflywheel energy storage and nonsynchronous AC/DC/AC electric transmission supplements power system operation

13 p0002 A77-10638

Energy storage --- quality, duration, methods and forms

13 p0006 A77-11040

Hybrid drive with kinetic energy store as vehicle drive

[UCRL-TRANS-11018] 13 p0120 N77-14486

Energy equivalents for current and prospective automotive fuels in Canada

[AD-A026155] 13 p0124 N77-14609

**KINETIC THEORY**

Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium

14 p0198 A77-28776

**KRYPTON 85**

An assessment of the materials needs for a Kr-85 fuel capsule

16 p0462 A77-48855

**KURILE ISLANDS**

The nature and characteristics of the distribution of helium and argon isotopes in the geothermal waters of the Kuril Islands and Kamchatka

13 p0048 A77-13589

**L****LABORATORIES**

ERDA Interlaboratory Work for Data Exchange (IWGDE) [LBL-5329]

15 p0352 N77-22998

**LAKES**

Effects of thermal pollution on certain aquatic invertebrates

[PB-263488/9] 15 p0368 N77-24673

**LAMINAR BOUNDARY LAYER**

Boundary-layer separation from the electrode wall of an MHD generator

13 p0048 A77-13711

**LAMINAR FLOW**

Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe

15 p0306 A77-36708

Study of the characteristics of convective heat transfer in cylindrical solar energy receivers by solving the conjugate problem of heat exchange

15 p0316 A77-37771

Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem

16 p0437 A77-47427

**LAND USE**

Utilization of remote sensing techniques to detect land use effects on wildland water quality

13 p0071 A77-18984

Does solar energy demand more land surface, and more materials or energy investment than nuclear energy or fossil fuels - A preliminary study

14 p0155 A77-21857

Growth effects of major land use projects. Volume 2: Compilation of land use based emission factors

[PB-255302/2] 13 p0092 N77-10709

The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 --- Bolivia

[E77-10028] 13 p0096 N77-11491

Draft environmental assessment of application by ERDA for a special land use permit for use of public lands in Wyoming for in situ coal gasification experiments

[UCID-17011] 13 p0100 N77-11572

Development of a multi-disciplinary ERTS user program in the state of Ohio

[E77-10045] 13 p0104 N77-12475

Interpretation of Pennsylvania agricultural land use from ERTS-1 data

[E77-10111] 14 p0215 N77-18525

Proceedings of a Symposium on Offshore Oil Potential and Related Land Use Impacts in the Central California Coastal Zone

[PB-259074/3] 14 p0215 N77-18547

A process for coastal resource management and impact assessment

[PB-264811/1] 15 p0376 N77-26004

Regional land use and energy modeling

[BNL-21809] 15 p0378 N77-26595

Western energy/environment monitoring study:

Planning and coordination summary

[PB-266256/7] 16 p0523 N77-29632

Land use, energy flow and policy making in society. SIHPAC handbook. A guide to the modeling of socio-economic phenomena

[PB-267134/5] 16 p0530 N77-30637

Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems

[PB-267832/4] 16 p0554 N77-33618

**LANDSAT SATELLITES**

Use of Landsat data for the detection of marine oil slicks --- for oil exploration and pollution control

15 p0267 A77-32244

Space: A resource for earth - An AIAA review --- Book

15 p0269 A77-32440

An application of ERTS technology to the evaluation of coal strip mining and reclamation in the northern Great Plains

[NASA-CR-149208] 13 p0104 N77-12486

LANDSAT (ERTS) used as a basis for geological volcanological mapping in the central Andes

[NASA-TM-75024] 15 p0390 N77-27474

**LANDSAT 1**

Geothermal flux through palagonitized tephra, Surtsey, Iceland - The Surtsey

temperature-data-relay experiment via Landsat-1

13 p0048 A77-13648

**LANTHANUM COMPOUNDS**

Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides

13 p0056 A77-15817

**LARGE SPACE STRUCTURES**

Large-scale space operations for Solar Power Satellites

[AIAA PAPER 77-1031] 16 p0413 A77-42483

SEP full-scale wing technology development

16 p0463 A77-48860

Composites for large space structures

[IAF PAPER 77-65] 16 p0507 A77-51416

**LASER ANEMOMETERS**

Laser anemometry in high velocity, high temperature boundary layers

15 p0288 A77-33708

**LASER APPLICATIONS**

The use of lasers for the inspection of heliotechnical reflectors

15 p0286 A77-33432

Using lasers to inspect solar-energy reflectors

16 p0427 A77-45545

Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea

16 p0433 A77-47080

Energy and technology review

[UCID-52000-76-2] 13 p0131 N77-15508

Abstracts: 1976 AFOSR Contractors' meeting on MHD Power Generation and Lasers

[AD-A027654] 13 p0133 N77-15845

Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies

[AD-A034995] 15 p0377 N77-26491

Gas-interface studies in large horizontal heat pipes

[LA-6646-MS] 16 p0520 N77-29455

Field ionization for laser isotope separation

[EPRI-NP-334] 16 p0552 N77-33512

**LASER CAVITIES**

Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser

15 p0289 A77-34221

Commercial application of laser fusion

[LA-UR-76-1459] 14 p0227 N77-19872

**LASER FUSION**

Prospects of generating power with laser-driven fusion

13 p0002 A77-10634

Radiolytic hydrogen production from a laser fusion system

13 p0035 A77-12795

Shaping of laser pulses in an amplifying system receiving input signals with a variable spectrum

13 p0053 A77-15237

- Advanced fuels for inertial confinement --- in laser fusion 13 p0061 A77-17016
- Heat transfer problems associated with laser fusion 13 p0068 A77-18441
- Lasers and controlled thermonuclear fusion. I 14 p0135 A77-19918
- Overview of energy research and development administration inertial confinement fusion program 14 p0146 A77-21744
- Hydrodynamics and compression of a laser irradiated target --- fusion energy requirements 14 p0146 A77-21745
- The current state and prospects for development of controlled thermonuclear fusion 14 p0157 A77-22537
- The national laser-fusion program 14 p0168 A77-23502
- Status of large neodymium glass lasers 14 p0168 A77-23503
- The laser solenoid - An alternate use of lasers in fusion power 14 p0198 A77-28962
- Laser fusion - Capital cost of inertial confinement 15 p0300 A77-36318
- Explosion compression of plasma up to critical values of thermonuclear microfusion. I, II 16 p0400 A77-41201
- Clean fusion concepts and efforts - A survey 16 p0435 A77-47356
- Advanced fuel nuclear reaction feasibility using laser compression. I 16 p0435 A77-47358
- Advanced fuel nuclear reaction feasibility using laser compression. II 16 p0435 A77-47359
- Future space experiments with levitated capacitor for thermonuclear microexplosions [IAF PAPER 77-ST-11] 16 p0508 A77-51575
- Development scenario for laser fusion [UCRL-76980] 14 p0216 N77-18575
- Commercial application of laser fusion [LA-UR-76-1459] 14 p0227 N77-19872
- Assessment of laser-driven fusion [PB-260691/1] 14 p0234 N77-20880
- Technology assessment of laser-fusion power production [LA-UR-76-2060] 15 p0351 N77-22975
- Conceptual design study for a laser fusion hybrid [UCRL-78682] 15 p0397 N77-27926
- LASER HEATING**
- Laser propulsion --- rocket heat engine design [IAF PAPER 76-166] 13 p0003 A77-10931
- LASER OUTPUTS**
- Shaping of laser pulses in an amplifying system receiving input signals with a variable spectrum 13 p0053 A77-15237
- Recent results in the research area 'energetics' with respect to nuclear energy research 14 p0200 A77-29300
- Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser 15 p0289 A77-34221
- Laser fusion - Capital cost of inertial confinement 15 p0300 A77-36318
- Power deposition in He from the volumetric He-3/n,p/H-3 reaction --- for direct nuclear pumped lasers 16 p0426 A77-45307
- Thermoelectronic laser energy conversion for power transmission in space 16 p0464 A77-48876
- LASER PLASMAS**
- Status of large neodymium glass lasers 14 p0168 A77-23503
- Some results of MHD-laser investigation 15 p0328 A77-39549
- Advanced fuel nuclear reaction feasibility using laser compression. I 16 p0435 A77-47358
- LATTICE PARAMETERS**
- The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction 13 p0042 A77-12850
- LAW (JURISPRUDENCE)**
- Law and solar energy systems - Legal impediments and inducements to solar energy systems 13 p0018 A77-12401
- The law for saving energy and its significance for energy politics 15 p0261 A77-31372
- Solar shade control - New law for a new technology 15 p0306 A77-36764
- Some legal-institutional implications of offshore wind energy conversion systems 16 p0489 A77-49086
- Laws and regulations affecting coal with summaries of Federal, State, and local laws and regulations pertaining to air and water pollution control, reclamation, diligence and health and safety, part 1 13 p0110 N77-12592
- Legal and public policy setting for geothermal resource development in Hawaii [PB-262910/3] 15 p0343 N77-22596
- Report to congress by the Federal Aviation Administration on the energy efficiency of agency regulations [AD-A034611] 15 p0359 N77-24103
- Solar energy applications and related legislation [PB-267901/7] 16 p0539 N77-31666
- LEACHING**
- Applicability of the Meyers Process for desulfurization of U.S. coal /A survey of 35 coal mines/ 14 p0191 A77-27278
- Soluble-salt processes for in-situ recovery of hydrocarbons from oil shale 16 p0441 A77-48472
- LEAD (METAL)**
- Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer [BLL-SMRE-TRANS-6562-(8313.4)] 45 p0371 N77-25485
- Study of the auxiliaries for lead-acid battery systems for peaking power [CONS/2114-3] 16 p0556 N77-33634
- LEAD COMPOUNDS**
- Performance of Army engines with unleaded gasoline-field study evaluation [AD-A032075] 15 p0342 N77-22490
- LEAD POISONING**
- Emission and deposition of petrol engine exhaust Pb. I - Deposition of exhaust Pb to plant and soil surfaces 15 p0333 A77-39655
- LEAD SULFIDES**
- Thermoelectric power of pseudoternary solid solutions 13 p0014 A77-11917
- LEAD TELLURIDES**
- The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction 13 p0042 A77-12850
- LEADING EDGES**
- Hydrodynamic equilibrium conditions for AG(BH) main strut-pod foil system using flap incidence control [AD-A027521] 13 p0127 N77-15220
- LEAKAGE**
- The influence of the transverse current nonuniformity, caused by current leakages onto the insulating walls of the channel, on the local characteristics of a nonideal MHD generator 15 p0329 A77-39553
- LEGAL LIABILITY**
- National Meeting on Air and Space Law, 7th, Universidad Nacional de Cordoba, Cordoba and La Falda, Argentina, August 13-16, 1975, Proceedings 13 p0053 A77-15050
- International law and the use of outer space for the production of solar power [IAF PAPER SL-77-62] 16 p0508 A77-51565
- LENS DESIGN**
- Evaluating a solar energy concentrator 13 p0047 A77-13505
- Solar energy concentration with liquid lenses 14 p0158 A77-22649
- A practical solar concentrator 14 p0171 A77-23657
- Solar-optical analyses of a mass-produced plastic circular Fresnel lens 14 p0181 A77-25906

# SUBJECT INDEX

# LIQUID COOLING

High level concentration of sunlight on silicon solar cells 15 p0267 A77-32208

Combination of focusing concentrators and focusing lenses 15 p0286 A77-33431

Combination of focons and ioclines with radiation receivers 16 p0427 A77-45544

**LENSES**

Assembly and testing of a 1.8 by 3.7 meter Fresnel lens solar concentrator [NASA-CR-150300] 15 p0378 N77-26610

**LEXAN (TRADEMARK)**

Use of Lexan and Kapton honeycombs to increase solar collector efficiency 13 p0068 A77-18448

**LIFE (DURABILITY)**

Efficiency calculations for Al<sub>1-x</sub>Ga<sub>1-x</sub>As-GaAs heteroface solar cells 15 p0257 A77-30720

Advanced fuel fusion experimentation with Migmacells II and III - Orbit diagnostics and lifetime measurements 16 p0436 A77-47362

**LIFE SUPPORT SYSTEMS**

Space construction base support requirements for environmental control and life support systems [ASME PAPER 77-ENAS-44] 16 p0432 A77-46885

**LIFT**

Numerical solution for the unsteady lifting characteristics of variable pitch cross-flow wind turbines 13 p0044 A77-12871

**LIFT AUGMENTATION**

Evaluation of propulsive lift enhancement and variable cycle engines for advanced tactical aircraft [AIAA PAPER 77-885] 15 p0321 A77-38575

**LIGHT AIRCRAFT**

Study of small turbofan engines applicable to single-engine light airplanes [NASA-CR-137944] 13 p0093 N77-11054

**LIGHT SOURCES**

Solar electricity - The hybrid system approach 16 p0413 A77-42556

Socio-economic determinants of a program for lunar industrialization in support of space light development Lunetta and Soletta [IAP PAPER A-77-66] 16 p0507 A77-51533

**LIGHT TRANSMISSION**

Use of transparent heat reflecting coatings in solar energy converters 15 p0285 A77-33430

Concentration of scattered radiation --- by solar collectors 15 p0316 A77-37768

Heat mirrored solar energy receivers [AIAA PAPER 77-728] 15 p0324 A77-39506

Utilization of transparent heat-reflecting coatings in solar-energy converters 16 p0426 A77-45543

Concentration of diffuse radiation --- by solar collectors 16 p0437 A77-47424

Thermoelectronic laser energy conversion for power transmission in space 16 p0464 A77-48876

**LIGHT WATER BREEDER REACTORS**

Energy storage in the form of latent heat 14 p0157 A77-22350

Energy investment in nuclear and solar power plants 15 p0257 A77-30599

Occupational radiation exposure at light water cooled power reactors, 1969-1975 [PB-257054/7] 13 p0125 N77-14740

An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-152688] 15 p0343 N77-22612

Conceptual design study for a laser fusion hybrid [UCRL-78682] 15 p0397 N77-27926

**LIGHTING EQUIPMENT**

Lumiducts for Ecopclis --- urban solar light collection and transmission system 13 p0079 A77-19116

Lighting with sunlight using sun tracking concentrators 15 p0260 A77-31245

**LIMESTONE**

Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497

**LIMITS (MATHEMATICS)**

Limiting mechanisms in MHD generator performance [AD-A025949] 13 p0111 N77-14879

**LINEAR ARRAYS**

Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297

**LINEAR PROGRAMMING**

The application of linear programming methods to the problem of choosing required reserves of energy for controlled plants 14 p0196 A77-28255

Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell 16 p0500 A77-50200

A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results [PB-252485/8] 13 p0088 N77-10662

**LINEAR SYSTEMS**

Internal problem for the end effect in a linear asynchronous MHD-machine operating at an arbitrary current load 15 p0295 A77-35799

**LINING PROCESSES**

Effect of ceramic coating of JT8D combustor liner on maximum liner temperatures and other combustor performance parameters [NASA-TM-X-73581] 13 p0126 N77-15037

**LIPIDS**

Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262

**LIQUEFACTION**

A study of the efficiency of hydrogen liquefaction 14 p0240 N77-21611

**LIQUEFIED NATURAL GAS**

Risk management of liquefied natural gas installations 13 p0002 A77-10451

Applications of cryogenic technology. Volume 8 --- Book 14 p0159 A77-22868

Liquefied natural gas for California 14 p0183 A77-26083

Political and economic justification for immediate realization of a syn fuels industry 14 p0191 A77-27276

The importation of liquefied natural gas 14 p0194 A77-27607

Ship steel weldments for low temperature service [PB-256997/8] 13 p0103 N77-12203

A study to obtain verification of Liquid Natural Gas (LNG) tank loading criteria [AD-A025716] 13 p0120 N77-14492

Bibliography on Liquefied Natural Gas (LNG) safety [NASA-TM-X-73408] 13 p0127 N77-15208

Small scale tests on control methods for some liquefied natural gas hazards [AD-A033522] 15 p0341 N77-22293

Economic feasibility: Fuel grade methanol from coal [TID-27156] 15 p0345 N77-22630

Supply of liquefied natural gas to the Northeast [BNL-50556] 15 p0392 N77-27521

Assessment of the role of the liquefied petroleum gas (LPG) engine in stage carriage service vehicles [TT-7605] 16 p0519 N77-29320

The strategic petroleum reserve and liquefied natural gas supplies [PB-265488/7] 16 p0520 N77-29598

**LIQUID AMMONIA**

Gasification of coals treated with non-aqueous solvents. I - Liquid ammonia treatment of a bituminous coal 14 p0198 A77-28778

**LIQUID COOLING**

Water requirements for an integrated SMG plant and mine operation 13 p0060 A77-16651

MHD systems with low cooling requirements 15 p0332 A77-39575

- The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification  
[ASME PAPER 77-JPGC-GT-7] 16 p0509 A77-51624
- LIQUID FLOW**  
Liquid flow pattern in extraction of geothermal energy 14 p0135 A77-19706
- Performance gravity-assisted heat pipes operated at small tilt angles  
[AIAA PAPER 77-750] 15 p0311 A77-37263
- A zero g variable conductance heat pipe using bubble pump injection  
[AIAA PAPER 77-752] 15 p0311 A77-37265
- Geothermal well stimulation with a secondary fluid 16 p0454 A77-48795
- Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations --- for geothermal applications 16 p0455 A77-48799
- LIQUID HYDROGEN**  
Liquid hydrogen as propellant for commercial aircraft  
[DGLR PAPER 76-188] 13 p0059 A77-16534
- A study of the efficiency of hydrogen liquefaction --- jet aircraft applications 15 p0279 A77-33377
- A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 15 p0279 A77-33378
- Some early perspectives on ground requirements of liquid hydrogen air transports 15 p0281 A77-33391
- Fuel subsystem characteristics for LH2 aircraft 15 p0281 A77-33393
- Development of a liquid hydrogen car 15 p0282 A77-33394
- Crash test of a liquid hydrogen automobile 15 p0282 A77-33397
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 15 p0284 A77-33409
- Solar energy depot --- using liquid hydrogen as fuel and oxygen as oxidizer  
[AIAA PAPER 77-726] 15 p0311 A77-37251
- ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- The liquid hydrogen option for the subsonic transport - A status report 16 p0458 A77-48819
- LH2 airport requirements study  
[NASA-CR-2700] 13 p0083 A77-10032
- An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports  
[NASA-CR-2699] 13 p0083 A77-10033
- The potential of liquid hydrogen as a military aircraft fuel  
[AD-A026666] 13 p0118 A77-14272
- A study of the efficiency of hydrogen liquefaction 14 p0240 A77-21611
- A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 14 p0240 A77-21612
- First World Hydrogen Energy Conference proceedings, volume 3 14 p0243 A77-21626
- Some early perspectives on ground requirements of liquid hydrogen air transports 14 p0243 A77-21628
- Fuel subsystem characteristics for LH2 aircraft 14 p0243 A77-21630
- Development of a liquid hydrogen car 14 p0244 A77-21632
- Crash test of a liquid hydrogen automobile 14 p0244 A77-21635
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 14 p0245 A77-21647
- LIQUID INJECTION**  
A zero g variable conductance heat pipe using bubble pump injection  
[AIAA PAPER 77-752] 15 p0311 A77-37265
- LIQUID LEVELS**  
Method and equipment for the introduction of liquid waste fuels into a fluidized layer  
[BLL-RTS-10400] 15 p0359 A77-4205
- LIQUID METALS**  
Liquid-metal MHD - Cycle studies and generator experiments 13 p0034 A77-12785
- Central station solar electric power using liquid metal heat transport 13 p0037 A77-12806
- Study of the properties of heat pipes with liquid-metal heat-transfer agents in low-temperature regimes 13 p0046 A77-13243
- Investigation of two-phase liquid-metal magnetohydrodynamic power systems 13 p0057 A77-16212
- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269
- The long term stability of magnetic liquids for energy conversion devices 14 p0177 A77-24573
- Experimental investigation of energy conversion efficiency during the interaction of a conducting-fluid piston with a magnetic field 14 p0204 A77-29618
- Initial generator tests with revised ambient-temperature liquid-metal MHD facility 15 p0326 A77-39538
- Sodium-nitrogen liquid-metal MHD facility initial test results 15 p0327 A77-39539
- An environmental assessment of liquid metal topping cycles --- in coal-fired fluidized bed processors for electric power generation 16 p0452 A77-48780
- Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 A77-26988
- LIQUID NITROGEN**  
Magnetic suspension densimeter for measurements on fluids of cryogenic interest 13 p0007 A77-11093
- LIQUID PHASES**  
Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels 14 p0177 A77-24852
- Upgrading coal liquids to gas turbine fuels. III - Exploratory process studies 14 p0178 A77-24853
- LIQUID SODIUM**  
Liquid-metal magnetohydrodynamic system evaluation --- coal-fired designs 13 p0034 A77-12784
- Central station solar electric power using liquid metal heat transport 13 p0037 A77-12806
- Design of sodium-cooled, central receiver solar power plant 16 p0461 A77-48843
- LIQUID SURFACES**  
Spectral response and efficiency relations in semiconductor liquid junction solar cells 15 p0264 A77-31823
- LIQUID-SOLID INTERFACES**  
Gas release during long-term operation of heat pipes 13 p0050 A77-14328
- A method of comparing flat-plate air and liquid solar collectors for use in space heating applications 16 p0472 A77-48941
- Development of nondestructive evaluation methods for coal-conversion systems  
[CONF-760472-2] 14 p0216 A77-18567
- LIQUID-VAPOR EQUILIBRIUM**  
Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures 16 p0412 A77-42406
- LIQUID-VAPOR INTERFACES**  
Excess liquid in heat-pipe vapor spaces  
[AIAA PAPER 77-748] 15 p0311 A77-37261
- LITHIUM**  
Development of compact lithium/iron disulfide electrochemical cells 13 p0026 A77-12715
- Lithium-aluminum/metal sulfide batteries  
[AIAA PAPER 77-483] 14 p0172 A77-23903

# SUBJECT INDEX

# LUNAR PROGRAMS

- Post-test analysis of Li/FeS<sub>2</sub> compact cells  
16 p0448 A77-48739
- Measured performance of a 3 ton LiBr absorption  
water chiller and its effect on cooling system  
operation  
[NASA-TM-X-73496] 13 p0105 A77-12518
- LITHIUM ALLOYS**  
Performance characteristics of solid  
lithium-aluminum alloy electrodes  
13 p0007 A77-11107
- Development status of lithium-silicon/iron sulfide  
load leveling batteries  
16 p0448 A77-48741
- Improved negative electrodes for lithium  
sulfide batteries  
16 p0448 A77-48742
- LITHIUM COMPOUNDS**  
Ambient temperature electric vehicle batteries  
based on lithium and titanium disulfide  
13 p0025 A77-12706
- Design and testing of lithium/iron sulfide  
batteries for electric-vehicle propulsion  
14 p0161 A77-22910
- Measured performance of a 3-ton LiBr absorption  
water chiller and its effect on cooling system  
operation  
16 p0498 A77-49165
- Cooling subsystem design in CUS solar house 3  
[COO-2858-1] 16 p0514 A77-28592
- LITHIUM HYDROXIDES**  
The lithium-water-air battery for automotive  
propulsion  
14 p0162 A77-22915
- LOADS (FORCES)**  
A study to obtain verification of Liquid Natural  
Gas (LNG) tank loading criteria  
[AD-A025716] 13 p0120 A77-14492
- LOCOMOTIVES**  
Evolution of thermal traction - From the diesel  
engine to the gas turbine  
13 p0004 A77-10976
- Will electricity power tomorrow's trains  
14 p0199 A77-29088
- LONG TERM EFFECTS**  
Gas release during long-term operation of heat pipes  
13 p0050 A77-14328
- The behavior of iron titanium hydride test beds -  
Long-term effects, heat transfer and modeling  
15 p0280 A77-33386
- The behavior of iron titanium hydride test beds:  
Long-term effects, heat transfer and modeling  
14 p0242 A77-21621
- LOUISIANA**  
Strategic petroleum reserve. Final environmental  
impact statement for Bayou Choctaw Salt Dome  
[PB-261584/9] 15 p0341 A77-22294
- LOW COST**  
Solar energy concentration with liquid lenses  
14 p0158 A77-22649
- Performance of low cost solar reflectors for  
transferring sunlight to a distant collector  
14 p0180 A77-25896
- Solar-optical analyses of a mass-produced plastic  
circular Fresnel lens  
14 p0181 A77-25906
- Low cost dynamic energy conversion systems  
14 p0196 A77-28171
- Development of a low capital cost electrolyzer ---  
for hydrogen production  
15 p0277 A77-33362
- Development of a small, low cost turbojet engine  
with thrust augmentation --- for RPV  
16 p0434 A77-47347
- Optimizing a low cost satellite energy system  
16 p0465 A77-48877
- Self sufficient energy integrated design and  
construction method for low cost-self help  
housing programs  
16 p0495 A77-49137
- On the study of applications of solar thermal  
energy for mobile homes  
16 p0501 A77-50204
- Low cost solar energy collection system  
[NASA-CASE-NPO-13579-3] 14 p0229 A77-20566
- Development of a low capital cost electrolyzer  
14 p0239 A77-21596
- Research and development of low cost processes for  
integrated solar arrays  
[COO-2721-76-1] 15 p0383 A77-26670
- Development of low cost, high energy-per-unit-area  
solar cell modules  
[NASA-CR-153977] 16 p0528 A77-30605
- Solar silicon via improved and expanded  
metallurgical silicon technology  
[NASA-CR-153415] 16 p0528 A77-30606
- LOW PRESSURE**  
Underground gasification --- of coal for deep  
deposit in situ processing  
15 p0308 A77-36813
- LOW TEMPERATURE**  
The utilization and economics of low temperature  
geothermal water for space heating  
13 p0030 A77-12756
- Development of thermal control methods for  
specialized components and scientific  
instruments at very low temperatures (follow-on)  
[NASA-CR-150152] 13 p0127 A77-15347
- Solar energy storage  
[AD-A028083] 14 p0213 A77-17605
- LOW TEMPERATURE PHYSICS**  
Design considerations for capillary heat pipes at  
cryogenic temperatures  
[ORNL-MIT-28] 15 p0361 A77-24430
- Low-temperature thermal energy storage  
[ORNL-TM-5795] 16 p0536 A77-31631
- LOW TEMPERATURE TESTS**  
Development of a low temperature phase change  
material package --- for spacecraft thermal  
control  
[AIAA PAPER 77-762] 15 p0325 A77-39514
- Preparation of porous carbon electrodes for low  
temperature H<sub>2</sub>-O<sub>2</sub> fuel cells  
16 p0420 A77-44059
- Flexible cryogenic heat pipe development program  
[NASA-CR-152027] 16 p0520 A77-29451
- LUBRICANT TESTS**  
Investigation of the causes of stuck servovalves  
in U.S. Army hydraulic systems using MIL-H-46170  
'Hydraulic Fluid, Rust Inhibited, Fire  
Resistant, Synthetic Hydrocarbon Base'  
[ASLE PREPRINT 77-AH-2A-1] 15 p0296 A77-35956
- LUBRICANTS**  
Waste POL disposal through energy recovery  
[AD-A031783] 14 p0235 A77-20957
- Antivear additives, wear studies on chemical  
addition agents for imparting an effective  
lubricating response in polysiloxane (silicone)  
fluids  
[AD-A033527] 15 p0340 A77-22270
- LUBRICATING OILS**  
Thermally induced migration of hydrocarbon oil  
15 p0268 A77-32375
- Fuels and lubricants --- an evaluation of military  
fuels and lubricants  
[AD-A032842] 15 p0359 A77-24314
- LUMINOUS INTENSITY**  
High-sensitivity detection procedures and devices  
for angular variations - Application to  
automatic control of a solar furnace heliostat  
14 p0166 A77-23386
- Composite concentrators with spherical radiation  
sources  
14 p0179 A77-25359
- Composite concentrators with spherical radiation  
sources --- in solar heating systems  
16 p0409 A77-41909
- Characteristics of the concentrated solar flux  
produced by the FMSC prototype --- Fixed Mirror  
Solar Concentrator  
16 p0474 A77-48953
- LUNAR BASES**  
Where do we locate the moon base --- considering  
polar regions as preferred lunar observatory sites  
16 p0504 A77-51023
- LUNAR ENVIRONMENT**  
Environmental impact of space manufacturing  
[AIAA PAPER 77-539] 15 p0266 A77-32062
- LUNAR OBSERVATORIES**  
Where do we locate the moon base --- considering  
polar regions as preferred lunar observatory sites  
16 p0504 A77-51023
- LUNAR PROGRAMS**  
Socio-economic determinants of a program for lunar  
industrialization in support of space light  
development Lunetta and Soletta  
[IAF PAPER A-77-66] 16 p0507 A77-51533

## LUNAR ROCKS

Energy and technology review --- measurement of lunar subsurface temperature and monitoring of atmospheric ozone  
[UCRL-52000-76-11] 15 p0396 N77-27651

## LUNAR TEMPERATURE

Energy and technology review --- measurement of lunar subsurface temperature and monitoring of atmospheric ozone  
[UCRL-52000-76-11] 15 p0396 N77-27651

## M

## MAGMA

Heat transport in geothermal systems 14 p0174 A77-24203  
Magma energy research project, volume 2, no. 2  
[SAND-76-0264-VOL-2-NO-2] 15 p0372 N77-25638

## MAGNESIUM ALLOYS

Supercorroding alloys for generating heat and hydrogen gas 16 p0458 A77-48820

## MAGNESIUM OXIDES

Hydration-dehydration cycling of MgO-Mg(OH)2 for application to solar heat storage systems  
[AI-ERDA-13178] 15 p0381 N77-26654

## MAGNET COILS

High speed superconducting generator 14 p0144 A77-21383  
Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator 14 p0144 A77-21386  
Power loss problems in EXTRAP coil systems [TRITA-PFU-77-02] 16 p0549 N77-32910

## MAGNETIC ANOMALIES

Gravity and ground magnetic surveys of the central mineral mountains, Utah, volume 6  
[PB-268423/1] 16 p0544 N77-32578

## MAGNETIC COILS

Superconducting induction coil for a doublet Tokamak experimental fusion power reactor 14 p0144 A77-21376  
Armature of the MIT-EPRI superconducting generator 14 p0157 A77-22575  
Element rating and coupling harmonics in a superconductive energy transfer system 16 p0411 A77-42164  
Superconducting magnetic energy storage [LA-UR-76-2047] 15 p0397 N77-27933

## MAGNETIC CONTROL

Thermonuclear fusion power 15 p0296 A77-35920  
Superconducting magnet development for the MHD program 15 p0331 A77-39569  
Nuclear fusion - Focus on Tokamak 16 p0407 A77-41645

## MAGNETIC EFFECTS

Explosively driven MHD generator power systems for pulse power applications 15 p0299 A77-36300  
The physics of magnetic separation 15 p0323 A77-39119

## MAGNETIC FIELD CONFIGURATIONS

PULSAR, an unconventional topping stage --- MHD generation with metallic armature produced magnetic flux compression 13 p0034 A77-12788  
Reduction of the transverse edge effect in linear machines with homogeneous secondary armature by changing the air gap configuration 15 p0310 A77-36939  
Predicted and measured finite-width effects in linear induction machines 16 p0413 A77-42628  
Review of toroidal theta-pinch theory 16 p0427 A77-45628

## MAGNETIC FIELDS

Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field --- for MHD generator 15 p0295 A77-35798  
The magnetic energy storage system used in ZT-1 --- toroidal plasma pinch experiment 15 p0299 A77-36314  
Field-reversed mirror as a D-T power reactor [UCRL-78082] 15 p0351 N77-22967

Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels [BLL-M-25473-(5828.4F)] 15 p0359 N77-24245

## MAGNETIC FLOW

PULSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544  
Predicted and measured finite-width effects in linear induction machines 16 p0413 A77-42628  
Finite length effects in linear induction machines with different iron contours 16 p0413 A77-42629

## MAGNETIC INDUCTION

Induction devices - A new type of magnetohydrodynamic converter 14 p0198 A77-28786  
Two-dimensional analysis of end effects in diagonal type nonequilibrium plasma MHD generator 15 p0297 A77-36097  
Finite length effects in linear induction machines with different iron contours 16 p0413 A77-42629

## MAGNETIC LEVITATION VEHICLES

Large-scale applications of superconductivity 16 p0412 A77-42475

## MAGNETIC MATERIALS

Black magnetic spherule fallout in the eastern Gulf of Mexico 13 p0052 A77-14890

## MAGNETIC MIRRORS

Assessment of the role of magnetic mirror devices in fusion power development 14 p0213 N77-17872  
Evaluation of the technical and economic feasibility of mirror fusion devices [UCRL-13695] 15 p0386 N77-26977

## MAGNETIC PUMPING

Supplementary plasma heating studies in the atomic energy commission, France 13 p0064 A77-17819  
Magnetic heat pumping [NASA-CASE-LEW-12508-2] 16 p0543 N77-32435

## MAGNETIC RESONANCE

Hydrogen atoms: Rare earth ions: Magnetic resonance studies on polycrystalline solids and surface systems relevant to catalysis and other energy-related research 13 p0117 N77-13798

## MAGNETIC SURVEYS

Geothermal significance of magnetotelluric sounding in the eastern Snake River Plain-Yellowstone region 15 p0310 A77-36999

## MAGNETIC SUSPENSION

Magnetic suspension densimeter for measurements on fluids of cryogenic interest 13 p0007 A77-11093  
Flywheel energy storage. II - Magnetically suspended superflywheel 15 p0323 A77-39315

## MAGNETIC SWITCHING

Progress in switching technology for MTS systems --- Magnetic Energy Transfer and Storage 15 p0303 A77-36377

## MAGNETIC TAPES

ERDA energy information data base: Magnetic tape description [TID-4581-R3] 13 p0102 N77-11695

## MAGNETOHYDRODYNAMIC FLOW

Non-equilibrium MHD power generation using non-seeded argon plasma 13 p0004 A77-11022  
Slag interaction phenomena on MHD generator electrodes [AIAA PAPER 77-109] 14 p0135 A77-19833  
Engineering aspects of magnetohydrodynamics; Proceedings of the Fifteenth Symposium, University of Pennsylvania, Philadelphia, Pa., May 24-26, 1976 14 p0139 A77-21214  
Investigation of two-dimensional electric effects in a sectional MHD-channel 15 p0317 A77-37930  
Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821

## MAGNETOHYDRODYNAMIC GENERATORS

- Performance theory of diagonal conducting wall MHD generators 13 p0001 A77-10202
- Effect of nonuniform conductivity in the boundary layer at the electrode wall on local characteristics of an MHD generator with a diagonal electrode configuration and a subsonic stream 13 p0001 A77-10423
- Study of the ionization of the additive in MHD installations 13 p0002 A77-10424
- Non-equilibrium MHD power generation using non-seeded argon plasma 13 p0004 A77-11022
- Energy conservation with advanced power generating systems 13 p0026 A77-12723
- MHD power generation - 1976 Status Report --- coal-fired design 13 p0033 A77-12782
- Investigation of direct coal-fired MHD power generation 13 p0034 A77-12783
- Liquid-metal magnetohydrodynamic system evaluation --- coal-fired designs 13 p0034 A77-12784
- Liquid-metal MHD - Cycle studies and generator experiments 13 p0034 A77-12785
- System studies of coal fired-closed cycle MHD for central station power plants 13 p0034 A77-12786
- PULSAR, an unconventional topping stage --- MHD generation with metallic armature produced magnetic flux compression 13 p0034 A77-12788
- MHD - Energy transformation by burning coal 13 p0045 A77-12940
- Calculation of turbulent magnetohydrodynamic boundary layers in MHD generator channels 13 p0046 A77-13242
- Evaporation of solution droplets in a high-temperature medium --- potassium carbonate MHD flow properties 13 p0046 A77-13254
- Influence of various losses on the characteristics of high-power MHD generators 13 p0046 A77-13258
- Boundary-layer separation from the electrode wall of an MHD generator 13 p0048 A77-13711
- Experiment on MHD generator with a large-scale superconducting magnet /ETL Mark V/ 13 p0049 A77-13728
- Diffuse thermal model of electrode erosion for MHD generators 13 p0049 A77-14319
- Study of cathode spots in the presence of slag films on the electrodes of an open-cycle MHD generator 13 p0053 A77-15005
- Shock tube for investigations of high-temperature MHD generators 13 p0054 A77-15665
- Study of the electrical characteristics of the boundary layer on the metal surfaces in the channels of an open cycle MHD generator 13 p0054 A77-15666
- Acoustic properties of subsonic MHD channel 13 p0054 A77-15668
- Investigation of two-phase liquid-metal magnetohydrodynamic power systems 13 p0057 A77-16212
- Schlieren measurements of a high density z-pinch 13 p0060 A77-16697
- Limiting capabilities with respect to electric power generation of a pulsed MHD generator operating at a resistive load 13 p0064 A77-17917
- Construction of two-dimensional steady-state solution of equations of a nonequilibrium magnetized plasma 13 p0065 A77-18130
- Slag interaction phenomena on MHD generator electrodes [AIAA PAPER 77-109] 14 p0135 A77-19833
- Some results of an investigation with the U-25 experimental-industrial facility, aimed at raising its parameters to the design level --- MHD generator energy converter 14 p0136 A77-20105
- Measurement of the excess oxidant ratio in the combustion products of an MHD-generator 14 p0136 A77-20107
- Engineering aspects of magnetohydrodynamics; Proceedings of the Fifteenth Symposium, University of Pennsylvania, Philadelphia, Pa., May 24-26, 1976 14 p0139 A77-21214
- Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility 14 p0139 A77-21215
- In-channel observations on coal slag --- in MHD generators 14 p0139 A77-21222
- Replenishment processes and flow train interaction --- in MHD generators 14 p0139 A77-21223
- Slag layers in direct coal-fired MHD power generation 14 p0139 A77-21224
- Test results on the spinel electrode module in laboratory and simulated MHD environment 14 p0140 A77-21227
- Crystallization and vaporization studies on synthetic coal slag compositions 14 p0140 A77-21228
- Thermionic emission characteristics of seeded coal slags 14 p0140 A77-21229
- Utilization of Western coal for MHD energy conversion 14 p0140 A77-21230
- Influence of coal type and drying upon MHD power plants and components 14 p0140 A77-21231
- Development of a baseline reference design for an open cycle MHD power plant for commercial service 14 p0140 A77-21232
- The technology base for large MHD superconducting magnets 14 p0140 A77-21233
- Progress on the Mark VI long-duration MHD generator 14 p0141 A77-21237
- Experimental investigation on a direct coal-fired MHD generator 14 p0141 A77-21238
- Effects of devolatilization kinetics and ash behavior on coal fired MHD combustor design 14 p0141 A77-21248
- Applications of the rapid devolatilization of coal in MHD power cycles 14 p0141 A77-21249
- Recent experimental studies of the interaction of potassium seed with coal slag in a direct-coal fired MHD generator 14 p0141 A77-21250
- Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251
- Voltage consolidation and control circuits for multiple-electrode MHD generators 14 p0141 A77-21252
- Curve of current delivered from MHD generator to a conventional power grid by inverter system 14 p0141 A77-21253
- Progress on the testing of refractories for directly-fired MHD air heater service 14 p0142 A77-21254
- Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility 14 p0142 A77-21257
- Consideration of three-dimensional effects in MHD power generators 14 p0142 A77-21261
- All-round technical and economic investigations of open-cycle industrial MHD generator channels and superconducting magnet systems 14 p0142 A77-21266
- System studies of coal fired-closed cycle MHD for central station power plants 14 p0142 A77-21267

- ECAS MHD system studies --- Energy Conversion Alternatives Study 14 p0142 A77-21268
- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269
- Problems of analysis of the power characteristic of a high capacity magnetohydrodynamic power station 14 p0143 A77-21270
- Air Force applications of lightweight superconducting machinery 14 p0144 A77-21360
- Superconducting magnets for an MHD test facility and base load power plant 14 p0144 A77-21379
- The minimum combustion gas recirculation ratio for fuel gas conversion in a MHD cycle 14 p0157 A77-22552
- The long term stability of magnetic liquids for energy conversion devices 14 p0177 A77-24573
- The Tethered Balloon Current Generator - A space shuttle-tethered subsatellite for plasma studies and power generation 14 p0184 A77-26200
- Induction devices - A new type of magnetohydrodynamic converter 14 p0198 A77-28786
- Experimental investigation of energy conversion efficiency during the interaction of a conducting-fluid piston with a magnetic field 14 p0204 A77-29618
- Evaporation of a drop of solution in a high-temperature medium --- potassium carbonate MHD flow properties 15 p0263 A77-31534
- Effect of various losses on the characteristics of powerful MHD generators 15 p0263 A77-31538
- Calculation of thermal stresses in ceramic elements of the refractory channel walls of a magnetohydrodynamic generator 15 p0263 A77-31540
- Investigation of a coaxial explosion-type MHD generator 15 p0268 A77-32313
- Electric power fluctuations in a MHD generator 15 p0269 A77-32432
- Cathode spots on metallic electrodes of an MHD-channel 15 p0269 A77-32518
- Experimental study of accelerating MHD-generator jets with supersonic flow distortion 15 p0269 A77-32519
- Influence of flow nonuniformity on plasma instability at the channel wall 15 p0269 A77-32520
- Processing of experimental data with the U-25 facility with the aid of a data measuring system --- MHD generator 15 p0269 A77-32521
- Laser anemometry in high velocity, high temperature boundary layers 15 p0288 A77-33708
- Boundary layer measurements of temperature and electron number density profiles in a combustion MHD generator 15 p0288 A77-33710
- Conductivity of seeded combustion products of acetylene systems 15 p0288 A77-34039
- Materials utilization in a direct coal-fired MHD generator system 15 p0292 A77-35151
- Structure of the electric field in the near-end space of a cylindrical electrode 15 p0295 A77-35607
- Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field --- for MHD generator 15 p0295 A77-35798
- Internal problem for the end effect in a linear asynchronous MHD-machine operating at an arbitrary current load 15 p0295 A77-35799
- Investigation of the Hall effect in the plasma of an inductive high-frequency discharge 15 p0297 A77-36088
- Two-dimensional analysis of end effects in diagonal type nonequilibrium plasma MHD generator 15 p0297 A77-36097
- Explosively driven MHD generator power systems for pulse power applications 15 p0299 A77-36300
- Design of closed-cycle MHD generator with nonequilibrium ionization and system 15 p0303 A77-36381
- Improvements in fluid machines and systems for energy conversion. Volume 4 --- Book 15 p0309 A77-36815
- Non equilibrium ionization in a linear magnetohydrodynamic generator, using a high pressure supersonic argon flow 15 p0309 A77-36817
- The influence of finite electrode segmentation on electrical performances of the Faraday MHD generator 15 p0309 A77-36936
- Reduction of the transverse edge effect in linear machines with homogeneous secondary armature by changing the air gap configuration 15 p0310 A77-36939
- Limiting values of the energy generated by pulsed MHD-converters 15 p0316 A77-37929
- Investigation of two-dimensional electric effects in a sectional MHD-channel 15 p0317 A77-37930
- An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207
- Experiment on MHD generator with a large scale superconducting magnet /ETL Mark V/ 15 p0325 A77-39527
- Mark VI MHD generator studies 15 p0325 A77-39528
- Experimental investigation of multiple-loaded diagonal conducting wall generators 15 p0325 A77-39529
- Gaseous electrode development at RMC --- for plasma channel operation in MHD generators 15 p0325 A77-39530
- The disk geometry applied to open cycle MHD power generation - Experiments and theoretical considerations 15 p0325 A77-39531
- Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser 15 p0326 A77-39532
- Results of closed cycle MHD power generation tests with a helium-caesium working fluid 15 p0326 A77-39533
- Molecular gas performance of a disk generator with swirl 15 p0326 A77-39534
- Experimental fluctuation analysis in a noble gas MHD generator 15 p0326 A77-39535
- Argon contamination associated with ceramic regenerative heat exchangers for closed cycle MHD 15 p0326 A77-39536
- Determination of the non-equilibrium MHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor 15 p0326 A77-39537
- Initial generator tests with revised ambient-temperature liquid-metal MHD facility 15 p0326 A77-39538
- Sodium-nitrogen liquid-metal MHD facility initial test results 15 p0327 A77-39539
- The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility 15 p0327 A77-39540
- Corrosion of potential MHD preheater materials in liquid slag and slag-seed 15 p0327 A77-39541
- Generator wall slag coating and material corrosion experiments 15 p0327 A77-39542
- Design and performance of high temperature ceramic electrode modules --- in MHD generators 15 p0327 A77-39543
- Progress on the testing of refractories for directly-fired MHD air heater service. II 15 p0328 A77-39544



- The evaluation of electrode materials for slag coated MHD channels 15 p0328 A77-39545
- Plasma luminosity fluctuations as a diagnostic tool --- for coal-fired MHD facility 15 p0328 A77-39547
- Some results of MHD-laser investigation 15 p0328 A77-39549
- Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel 15 p0328 A77-39550
- Electrical behavior of slag coatings in coal-fired MHD generators 15 p0328 A77-39551
- Axial field limitations in MHD generators 15 p0328 A77-39552
- The influence of the transverse current nonuniformity, caused by current leakages onto the insulating walls of the channel, on the local characteristics of a nonideal MHD generator 15 p0329 A77-39553
- Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the O02 facility MHD generator 15 p0329 A77-39554
- Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators 15 p0329 A77-39555
- Three dimensional current distribution in diagonal conducting wall channels 15 p0329 A77-39556
- Coupled electrical and fluid calculations in the cross plane in linear MHD generators 15 p0329 A77-39557
- Calculation of end effects in open-cycle MHD power generators 15 p0329 A77-39558
- An experimental investigation of fluctuating properties within a combustion MHD generator 15 p0330 A77-39559
- A consideration of some three-dimensional effects in MHD channel 15 p0330 A77-39560
- Electrode phenomena in slagging MHD channels 15 p0330 A77-39561
- Slag flow and current transport in a simulated generator environment 15 p0330 A77-39562
- Some properties of coal slags of importance to MHD 15 p0330 A77-39563
- Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers 15 p0330 A77-39564
- Devolatilization of pulverized coal during rapid heating --- in exhaust gases of combustion driven MHD generators 15 p0331 A77-39566
- Subsonic MHD-diffuser performance with high blockage 15 p0331 A77-39567
- Ignition and combustion behavior of pulverized coal jets in hot oxidizing atmospheres --- for MHD systems 15 p0331 A77-39568
- Superconducting magnet development for the MHD program 15 p0331 A77-39569
- Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system 15 p0331 A77-39570
- A heat capacitor for MHD electric power generation systems 15 p0331 A77-39571
- Dynamic modeling and control of magnetohydrodynamic/steam electrical power generating plants 15 p0332 A77-39572
- Part-load performance and voltage-current characteristics of a base load MHD generator 15 p0332 A77-39573
- Economic and energy considerations in MHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
- MHD systems with low cooling requirements 15 p0332 A77-39575
- Coal fired non-equilibrium closed cycle MHD power plant system since ECAS --- Energy Conversion Alternatives Study 15 p0332 A77-39576
- Status of the reference dual-cycle MHD-steam power plant 15 p0332 A77-39577
- Open-cycle coal burning MHD power plants for commercial service 15 p0333 A77-39578
- Threshold capabilities of a pulsed MHD converter for the production of electric power with a resistive load 16 p0399 A77-40591
- Utility views of MHD power generation [AIAA 77-1010] 16 p0403 A77-41557
- Predicted and measured finite-width effects in linear induction machines 16 p0413 A77-42628
- Finite length effects in linear induction machines with different iron contours 16 p0413 A77-42629
- Ionization instability in non-equilibrium MHD generators 16 p0416 A77-42894
- A simplified technique for determining the boundary layer voltage loss in MHD generators 16 p0416 A77-42897
- Elimination of current concentration due to Hall effect by variable resistive electrodes 16 p0418 A77-43119
- On the construction of plane stationary solutions of equations for nonequilibrium magnetized plasma 16 p0420 A77-43705
- Analogy between thermal-convective and magnetohydrodynamic instabilities 16 p0425 A77-44690
- Calculation of a three-dimensional model for a conduction MHD machine with frame-type electrodes 16 p0425 A77-44694
- Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821
- MHD combustor effluent chemistry measurements using Raman scattering 16 p0425 A77-44825
- Effect of two-dimensional inhomogeneities on the properties of framed MHD channels 16 p0428 A77-46088
- Increasing the electrical strength of the interelectrode gap in an MHD generator 16 p0428 A77-46091
- A simple physical model of a magnetohydrodynamic generator 16 p0443 A77-48570
- MHD power generation with fully ionized seed 16 p0443 A77-48571
- Environmental assessment of advanced energy conversion technologies 16 p0452 A77-48778
- Design of the Montana Magnetohydrodynamics Component Development and Integration Facility 16 p0458 A77-48822
- A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute 16 p0458 A77-48823
- Progress in channel development for direct coal fired MHD 16 p0458 A77-48824
- Evaluation of MHD-thermionic-steam cycles 16 p0467 A77-48895
- Comparative evaluation of technical and economic indices for MHD and thermionic topplers for steam turbine facilities 16 p0469 A77-48909
- RP oscillations of a plasma in crossed E x B fields 16 p0503 A77-50350
- A large conventional MHD magnet 16 p0503 A77-50433
- Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator [WSS/CI PAPER 76-53] 16 p0508 A77-51611
- A summary of the ECAS MHD power plant results [NASA-TN-X-73491] 13 p0086 A77-10642
- Costs of alternative sources of electricity [PB-255765/0] 13 p0107 A77-12528

- Limiting mechanisms in MHD generator performance  
[AD-A025949] 13 p0111 N77-12879
- On the nature of fluctuations in an open cycle magnetohydrodynamic generator 13 p0117 N77-13841
- Abstracts: 1976 AFOSR Contractors' meeting on MHD Power Generation and Lasers  
[AD-A027654] 13 p0133 N77-15845
- Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls  
[NASA-TN-D-8396] 14 p0207 N77-16445
- Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator  
[NASA-TN-D-8374] 14 p0213 N77-17852
- Design study of superconducting magnets for a combustion magnetohydrodynamic (MHD) generator  
[NASA-CN-135178] 14 p0234 N77-20886
- High power study, superconducting generators  
[AD-A031620] 15 p0342 N77-22408
- Results of closed cycle MHD power generation test with a helium-cesium working fluid  
[NASA-TN-X-73621] 15 p0357 N77-23936
- MHD generator investigations --- feasibility analysis  
[AD-A032790] 15 p0358 N77-23952
- A numerical model to evaluate the behavior of a regenerative heat exchanger at high temperature --- for magnetohydrodynamic generator  
[TH-76-I-66] 15 p0377 N77-26439
- Applied research in the general area of charged particle chemistry related to coal-fired MHD  
[PB-263873/2] 15 p0387 N77-26987
- Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 N77-26988
- TRW 25 MW/sub T/staged MHD coal combustor conceptual design study  
[TID-27145] 15 p0396 N77-27922
- MHD combustor design study --- coal-fired systems  
[TID-27144] 15 p0396 N77-27923
- Two-phase Hartmann flows in the MHD generator configuration  
[AD-A036452] 16 p0518 N77-28948
- High power study - power conditioning --- for magnetohydrodynamic generators and turbine driven alternators  
[AD-A038724] 16 p0522 N77-29625
- Development and characterization of materials for open cycle MHD  
[BNWL-2004-3] 16 p0541 N77-31969
- MAGNETOHYDRODYNAMIC STABILITY**
- Minor radius compression experiments --- for ohmic heating efficiency improvement in Tokamaks  
16 p0407 A77-41683
- Ionization instability in non-equilibrium MHD generators  
16 p0416 A77-42894
- Analogy between thermal-convective and magnetohydrodynamic instabilities  
16 p0425 A77-44690
- Review of toroidal theta-pinch theory  
16 p0427 A77-45628
- Methods of 'tailoring' ion distributions in phase space /'morphodynamics'/ --- in Sigma-type fusion reactors  
16 p0436 A77-47364
- MHD power generation with fully ionized seed  
16 p0443 A77-48571
- MAGNETOHYDRODYNAMIC TURBULENCE**
- Calculation of turbulent magnetohydrodynamic boundary layers in MHD generator channels  
13 p0046 A77-13242
- MAGNETOHYDRODYNAMICS**
- Symposium on the Engineering Aspects of Magnetohydrodynamics, 16th, University of Pittsburgh, Pittsburgh, Pa., May 16-18, 1977, Proceedings  
15 p0325 A77-39526
- MHD generator investigations --- feasibility analysis  
[AD-A032790] 15 p0358 N77-23952
- Two-phase Hartmann flows in the MHD generator configuration  
[AD-A036452] 16 p0518 N77-28948
- MAINTAINABILITY**
- A new maintenance concept applied in the design of a new industrial gas turbine in the 100 MW class  
16 p0429 A77-46410
- MAINTENANCE**
- R&M - Today's heating and cooling vs. solar energy  
13 p0002 A77-10482
- A guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines  
13 p0033 A77-12779
- MALI**
- The role of solar energy in developing nations - The perspectives in Mali  
13 p0080 A77-19125
- MAN ENVIRONMENT INTERACTIONS**
- Environmental aspects of energy conversion and use  
13 p0006 A77-11044
- Energy analysis and the coupling of man and estuaries  
15 p0290 A77-34449
- Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer  
15 p0290 A77-34895
- Introductory remarks on space observations of long-term climatic changes produced by escalating energy use  
[IAF PAPER A-77-01] 16 p0507 A77-51508
- MANAGEMENT ANALYSIS**
- Management analysis of nuclear allocation for the generation of electricity  
16 p0413 A77-42590
- MANAGEMENT METHODS**
- Energy management --- resources, supply, conversion and utilization  
15 p0304 A77-36424
- Accounting methods for new-technology non-utility energy installations  
15 p0322 A77-38675
- National Airlines Fuel Management and Allocation Model  
16 p0419 A77-43399
- Energy: The policy planning framework in state governments. Volume 1: Summary report  
[PB-254466/6] 13 p0089 N77-10665
- Energy: The policy planning framework in state governments. Volume 2: Appendices  
[PB-254467/4] 13 p0089 N77-10666
- Optimizing the use of materials and energy in transportation construction  
[PB-253713/2] 13 p0096 N77-11475
- Structural reform in the electric power industry  
[PB-264589/3] 15 p0389 N77-27316
- Energy management in residential and small commercial buildings  
[BNL-50576] 15 p0392 N77-27511
- US Navy energy R and D  
[AD-A039546] 16 p0529 N77-30623
- Methodology for the analysis of the impacts of electric power production in the West  
[LA-6720-PB] 16 p0533 N77-31428
- MANAGEMENT PLANNING**
- Contribution to the solution of planning problems in electric power generation /effects of random disturbances/  
15 p0294 A77-35399
- Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units  
13 p0096 N77-11525
- Methodology for ranking geothermal reservoirs in non-electric industrial applications  
[NTR-7241] 14 p0222 N77-19610
- Fossil energy research program of the Energy Research and Development Administration, FY 1977  
[ERDA-76-63] 14 p0222 N77-19611
- Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641
- Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642
- Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- Study to assess the application of shadow pricing techniques to national energy resource planning  
[BNL-50537] 15 p0369 N77-24997

# SUBJECT INDEX

# MARKET RESEARCH

- Energy and resource planning group  
[JCR-L-50029-76] 15 p0372 N77-25634
- The potential for reusable homogeneous containers  
[PB-265100/8] 16 p0518 N77-29007
- Optimization models for planning economic development  
[AD-A039165] 16 p0531 N77-31024
- Management plan for enhanced oil recovery. Volume 1: Program strategy  
[ERDA-77-15/1-VOL-1] 16 p0536 N77-31629
- The reporting of federal research and development resources applied to innovation  
[PB-266765/7] 16 p0541 N77-32009
- Environmental assessment of geopressured waters and their projected uses  
[PB-268289/6] 16 p0544 N77-32579
- Improved engineering-economic model of residential energy use  
[ORNL-COM-8] 16 p0557 N77-33644
- MANAGEMENT SYSTEMS**
- Risk management of liquefied natural gas installations 13 p0002 A77-10451
- MANGANESE COMPOUNDS**
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families 14 p0238 N77-21572
- MANIPULATORS**
- The assembly of large structures in space --- radio astronomy telescope and microwave antenna 16 p0524 N77-29770
- MANNED SPACECRAFT**
- Advanced fuel fusion application to manned space propulsion 16 p0436 A77-47367
- MANUALS**
- Buying solar --- consumer information  
[PB-262134/0] 15 p0348 N77-22673
- Planner's energy workbook: A users' manual for land use and energy utilization  
[BNL-21546] 15 p0364 N77-24596
- MANUFACTURING**
- Solar energy for the Australian food processing industry 14 p0181 A77-25900
- Low energy production processes in manufacturing of silicon solar cells 16 p0486 A77-49055
- Demonstration of the feasibility of automated silicon solar cell fabrication  
[NASA-CR-135095] 13 p0129 N77-15492
- Solar collector manufacturing activity, January-June 1976  
[PB-258665/5] 14 p0208 N77-16455
- Fuel cell stacks  
[AD-A030375] 14 p0213 N77-17603
- Silicon thin film crystallization and solar cell fabrication  
[PB-261715/7] 15 p0348 N77-22670
- Silicon Schottky photovoltaic diodes for solar energy conversion  
[PB-263172/9] 15 p0357 N77-23624
- Environmental considerations of selected energy conserving manufacturing process options. Volume 4: Petroleum refining industry report  
[PB-264270/0] 15 p0384 N77-26681
- Environmental considerations of selected energy conserving manufacturing process options. Volume 5: Pulp and paper industry report  
[PB-264271/8] 15 p0384 N77-26682
- Environmental considerations of selected energy conserving manufacturing process options. Volume 6: Olefins industry report  
[PB-264272/6] 15 p0384 N77-26683
- Environmental considerations of selected energy conserving manufacturing process options. Volume 7: Ammonia industry report  
[PB-264273/4] 15 p0384 N77-26684
- Environmental considerations of selected energy conserving manufacturing process options. Volume 8: Alumina/aluminum industry report  
[PB-264274/2] 15 p0384 N77-26685
- Environmental considerations of selected energy conserving manufacturing process options. Volume 9: Textile industry report  
[PB-264275/9] 15 p0384 N77-26686
- Environmental considerations of selected energy conserving manufacturing process options. Volume 10: Cement industry report  
[PB-264276/7] 15 p0384 N77-26687
- Environmental considerations of selected energy conserving manufacturing process options. Volume 11: Glass industry  
[PB-264277/5] 15 p0384 N77-26688
- Environmental considerations of selected energy conserving manufacturing process options. Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689
- Environmental considerations of selected energy conserving manufacturing process options. Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 N77-26690
- Environmental considerations of selected energy conserving manufacturing process options. Volume 14: Primary copper industry report  
[PB-264280/9] 15 p0385 N77-26691
- Environmental considerations of selected energy conserving manufacturing process options. Volume 15: Fertilizer industry report  
[PB-264281/7] 15 p0385 N77-26692
- Solar collector manufacturing activity  
[PB-266985/1] 16 p0558 N77-33664
- MAPPING**
- Applying computer-drawn maps of geologic data to analysis of mining problems  
[PB-255497/0] 13 p0096 N77-11518
- MARINE BIOLOGY**
- Conference proceedings, Energy from the Oceans, Fact or Fantasy  
[PB-256093/6] 13 p0108 N77-12547
- Marine pastures: A by-product of large (100 megawatt or larger) floating ocean-thermal power plants  
[COO-2581-3] 16 p0555 N77-33625
- MARINE ENVIRONMENTS**
- Economic aspects of Ocean Thermal Energy Conversion  
[PB-256093/6] 16 p0484 A77-49041
- Conference proceedings, Energy from the Oceans, Fact or Fantasy  
[PB-256093/6] 13 p0108 N77-12547
- MARINE PROPULSION**
- Superconducting machinery for Naval ship propulsion 14 p0144 A77-21361
- Designing gas turbines for the industrial and marine field 16 p0429 A77-46404
- System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications 16 p0445 A77-48718
- An evaluation of methanol, ethanol, the propanols, and the butanols as ship propulsion fuels  
[AD-A033483] 15 p0354 N77-23277
- MARINE RESOURCES**
- The conversion of ocean farm kelp to methane and other products 15 p0314 A77-37662
- Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations --- Book  
[PB-256093/6] 16 p0428 A77-46250
- Conference proceedings, Energy from the Oceans, Fact or Fantasy  
[PB-256093/6] 13 p0108 N77-12547
- MARINE TECHNOLOGY**
- OTEC - Aerospace and ocean engineering in partnership --- Ocean Thermal Energy Conversion  
[AIAA PAPER 77-296] 13 p0066 A77-18227
- Radioisotope power sources in the terrestrial and marine environment 14 p0196 A77-28170
- MARITIME SATELLITES**
- Space: A resource for earth - An AIAA review --- Book 15 p0269 A77-34440
- MARKET RESEARCH**
- A summary of solar heating and cooling of buildings /SHACOB/ - Phase I demonstration planning studies 13 p0039 A77-12821
- The dynamics of STOL /The Daniel and Florence Guggenheim Lecture/ --- utility aircraft for short haul service in remote areas  
[ICAS PAPER 76-01] 13 p0081 A77-19247

- Evaluation of the practical aspects of the use of coal derived synthetic fuels  
[ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411
- Commodity hydrogen from off-peak electricity 15 p0283 A77-33403
- The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496
- The competitive market for commercial VSTOL [AIAA 77-573] 15 p0290 A77-34933
- International energy evaluation system 15 p0319 A77-38216
- A derived demand model of energy demand in the transportation sector 15 p0319 A77-38217
- Stimulation of the solar industry by way of the Federal Buildings Program 16 p0462 A77-48850
- Prospectus on commercialization of solar heating and cooling systems 16 p0470 A77-48920
- Payback of solar systems --- cost effectiveness evaluation by dynamic economical model 16 p0493 A77-49115
- Solar system market capture in the climato-economic regions of the United States 16 p0493 A77-49116
- Economics of depletable resources: Market forces and intertemporal bias [PB-255623/1] 13 p0111 A77-12930
- Petroleum market shares: A report on sales of distillate and residual fuel oil to ultimate consumers, 1975 [PB-260565/7] 15 p0341 A77-22292
- Incremental pricing of supplemental gas [PB-263689/2] 15 p0360 A77-24319
- Petroleum market shares - A report on sales of refined petroleum products, 1972 through 1975: Aviation gasoline, jet fuels, middle distillate fuel oils, residual fuel oil, motor gasoline [PB-262726/3] 15 p0360 A77-24321
- Evaluation of rail rapid transit and express bus service in the urban commuter market [PB-265236/0] 15 p0398 A77-28046
- The marketability of integrated energy/utility systems [PB-266042/1] 16 p0523 A77-29626
- MARKETING**
- Analysis of state solar energy options [PB-254730/5] 13 p0091 A77-10688
- Petroleum market shares. Report on sales of propane to ultimate consumers, 1975 [PB-255624/9] 13 p0108 A77-12540
- Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0237 A77-21558
- Potential for producing and marketing gasoline substitutes from western coal [BNWL-2080 (RAP-4)] 15 p0340 A77-22291
- An economic model of new crude oil and natural gas supplies in the lower 48 states 16 p0552 A77-33596
- MASS FLOW**
- Slag flow and current transport in a simulated generator environment 15 p0330 A77-39562
- An investigation of peristaltic pumping phenomena with wind energy applications 16 p0545 A77-32586
- MASS FLOW RATE**
- Optimal mass flow rates through flat plate solar collector panels [ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524
- Two-phase flow in geothermal energy sources [TID-27129] 14 p0250 A77-21689
- MASS SPECTROSCOPY**
- Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262
- Chemical characterization of diesel exhaust particulates [PERC/RI-77/5] 16 p0540 A77-31671
- MASS TRANSFER**
- Heat transfer - A review of 1975 literature 13 p0002 A77-10615
- Future energy production systems: Heat and mass transfer processes. Volume 1 --- Book 13 p0056 A77-16201
- Heat and mass transfer for solar energy utilization 13 p0057 A77-16205
- Future energy production systems: Heat and mass transfer processes. Volume 2 --- Book 14 p0174 A77-24201
- Problems of heat and mass transfer in geothermal energetics 14 p0174 A77-24202
- Some aspects of heat and mass transfer in geothermal wells 14 p0175 A77-24209
- Heat and mass transfer problems associated with alternative energy production 14 p0176 A77-24216
- Investigation of the 'crisis' of heat and mass transfer in low-temperature wickless heat pipes 15 p0316 A77-37927
- Heat and mass transfer analysis of Bacon-type hydrogen-oxygen fuel cells - The volume average velocity 15 p0321 A77-38531
- The rate of mass transfer in a solar regenerator 15 p0323 A77-39109
- Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- MATERIALS HANDLING**
- The physics of magnetic separation 15 p0323 A77-39119
- MATERIALS RECOVERY**
- The reprocessing of nuclear fuels 13 p0055 A77-15807
- Energy and environmental impacts of materials alternatives - An assessment of quantitative understanding 13 p0070 A77-18738
- Demonstration of pyrolysis and materials recovery in San Diego, California 14 p0137 A77-20521
- Recent experimental studies of the interaction of potassium seed with coal slag in a direct-coal fired MHD generator 14 p0141 A77-21250
- Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251
- New life for old garbage - Resource and energy recovery from solid wastes 14 p0199 A77-29096
- Energy from wastes 15 p0272 A77-33280
- Energy from wood wastes 15 p0273 A77-33301
- Recovering metal from trash 15 p0287 A77-33529
- The Garrett oil-from-waste process and resource recovery system 15 p0293 A77-35162
- District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164
- Union Electric Company's 8000 ton per day solid waste utilization system 15 p0313 A77-37656
- Resource recovery and flash pyrolysis of municipal refuse 15 p0313 A77-37657
- The PUROX System --- solid waste partial oxidation to fuel gas 15 p0315 A77-37671
- Synthetic carbonaceous fuel and feedstock using nuclear power, air and water 15 p0321 A77-38532
- Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system 15 p0331 A77-39510
- Energy and resource recovery from solid wastes 16 p0434 A77-47215
- Modern incineration - A proven way for recovery of energy and metals 16 p0434 A77-47220
- Thermal processing of municipal solid waste for resource and energy recovery --- Book 16 p0438 A77-47951
- Science and technology of oil shale --- Book 16 p0444 A77-48502

## SUBJECT INDEX

## MATHEMATICAL MODELS

Resource recovery technology for urban decision-makers  
[PB-252458/5] 13 p0093 A77-10964

An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components  
[PB-267629/4] 16 p0531 A77-31046

Systems studies of energy conservation: Methane produced from coalbeds, volume 1  
[MERC/CR-77/4-VOL-1] 16 p0558 A77-33660

Reliability study of vapor recovery systems at service stations  
[PB-267613/8] 16 p0560 A77-33700

**MATERIALS SCIENCE**

Intermetallic compounds - Background and results of twenty years of research 13 p0014 A77-11600

Electric vehicle batteries - Opportunities for materials improvement 13 p0049 A77-13736

**MATERIALS TESTS**

Practical aspects of solar heating - A review of materials use in solar heating applications 13 p0049 A77-13743

Oxidation-erosion of materials in high velocity hot gases 15 p0270 A77-32604

The compatibility of containment materials for thermochemical hydrogen production 15 p0276 A77-33347

Generator wall slag coating and material corrosion experiments 15 p0327 A77-39542

Contribution to procedures for testing Silazane resin coatings --- for solar concentrators 16 p0443 A77-48522

The weatherability of solar energy utilization materials - Preliminary discussions 16 p0487 A77-49070

**MATHEMATICAL MODELS**

Energy: Mathematics and models; Proceedings of the Conference, Alta, Utah, July 7-11, 1975 13 p0008 A77-11233

Modeling residential energy use 13 p0027 A77-12726

Parametric studies of the thermal trap flat plate collector 13 p0068 A77-18443

A system model for the investigation of alternative energy strategies --- German book 13 p0080 A77-19181

All-round technical and economic investigations of open-cycle industrial MHD generator channels and superconducting magnet systems 14 p0142 A77-21266

Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation 14 p0149 A77-21794

Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815

Mathematical simulation of the fixed-bed pressurized gasification process 14 p0164 A77-23097

A mathematical model for the digital computation of the hours of sunshine on an inclined plane 14 p0166 A77-23382

Free thermal convection in geothermal fields - Physical understanding and mathematical modeling 14 p0174 A77-24204

A direct convertor based upon space charge effects 14 p0184 A77-26160

Design and simulation studies for the Shenandoah Community Center large-scale solar cooking demonstration [ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520

Mathematical modeling of in situ oil shale retorting 14 p0196 A77-28434

Energy demands: Modeling methods and techniques --- French book 15 p0264 A77-31595

Critical comments concerning the application of the availability concept in power plant technology 15 p0265 A77-31850

Use of a Lowry-type spatial allocation model in an urban transportation energy study 15 p0265 A77-31899

A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives 15 p0285 A77-33421

A parametric analysis of the structure of international energy consumption 15 p0298 A77-36242

A simple model for solar energy economics in the U.K. 15 p0298 A77-36245

International energy demand model - Twenty OECD country models 15 p0318 A77-38215

International energy evaluation system 15 p0319 A77-38216

A derived demand model of energy demand in the transportation sector 15 p0319 A77-38217

Energy R&D modeling for budgetary decisions 15 p0319 A77-38218

A United States energy model economically driven by a global growth simulation 15 p0319 A77-38220

The Energy Supply Planning Model - A working tool for regional analysis of alternative national energy policies 15 p0319 A77-38221

Heat and mass transfer analysis of Bacon-type hydrogen-oxygen fuel cells - The volume average velocity 15 p0321 A77-38531

Mark VI MHD generator studies 15 p0325 A77-39528

Calculation of end effects in open-cycle MHD power generators 15 p0329 A77-39558

Modelling of entrained-bed pulverized coal gasifiers 16 p0401 A77-41321

An econometric analysis of energy over the next 75 years 16 p0414 A77-42637

Mathematical method for determining reaction networks in chemical systems 16 p0418 A77-43093

A two-stage forecasting methodology for developing a national energy policy 16 p0419 A77-43144

On the theory and solar application of inductive grids --- wave diffraction modeling and far IR measurement 16 p0419 A77-43556

Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants 16 p0420 A77-44178

Validity of the isotropic-distribution approximation in solar energy estimations 16 p0422 A77-44477

Calculation of a three-dimensional model for a conduction MHD machine with frame-type electrodes 16 p0425 A77-44694

Quasi-analog models of large systems of algebraic equations 16 p0433 A77-46959

Molten carbonate fuel cell model 16 p0447 A77-48737

Deterministic insolation estimates for solar total energy systems 16 p0462 A77-48847

A new mathematical model for Stirling cycle machines 16 p0465 A77-48884

Performance of air-cooled flat plate collectors 16 p0472 A77-48942

A generalized numerical model for predicting energy transfers and performance of large solar ponds 16 p0482 A77-49025

Model calculations for metal-insulator-semiconductor solar cells 16 p0500 A77-50050

Mathematical simulation and empirical determination of the aerochemical and thermal atmospheric pollution resulting from energy conversion processes [DLR-IE-553-75/1] 13 p0091 A77-10700

Mathematics for energy [PB-252463/5] 13 p0098 A77-11543

Flight data analysis and further development of variable-conductance heat pipes [NASA-CR-137953] 13 p0118 A77-14374

- Precipitation scavenging of fossil-fuel effluents  
[PB-256649/5] 13 p0124 N77-14630
- Regional energy system for the planning and  
optimization of national scenarios (RESPONS).  
Clean coal energy: Source-to-use economics  
project  
[ERDA-76-109] 14 p0222 N77-19602
- Preliminary report on simulation of a heliostat  
field  
[ERDA-TR-158] 14 p0226 N77-19782
- Energy model data base program  
[BNL-21545] 14 p0250 N77-21687
- Stochastic modelling of site wind characteristics  
[PB-261178/8] 15 p0351 N77-22775
- Mathematical models for use in planning regional  
water resources and energy systems  
[PB-261364/4] 15 p0352 N77-23022
- Development and adaptation of field modulated  
generator systems for wind energy applications  
[PB-263604/1] 15 p0357 N77-23625
- Summary description of the BOOM1 model ---  
simulating power plant impact on isolated  
communities  
[LA-6424-MS] 15 p0369 N77-25010
- A numerical model to evaluate the behavior of a  
regenerative heat exchanger at high temperature  
--- for magnetohydrodynamic generator  
[TH-76-E-66] 15 p0377 N77-26439
- Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- Energy Model Data Base (EMDB) using system 2000  
[BNL-21854] 16 p0541 N77-31814
- MATRICES (CIRCUITS)**  
The influence of parameter dispersion of  
electrical cells on the array power output  
16 p0420 A77-44264
- MATRICES (MATHEMATICS)**  
Project Independence Evaluation System (PIES)  
documentation. Volume 15: Standard data tables  
for PIES  
[PB-265195/8] 16 p0523 N77-29629
- MCDONNELL DOUGLAS AIRCRAFT**  
The next-generation subsonic transport  
[SAWE PAPER 1127] 13 p0016 A77-12195
- MEASURING INSTRUMENTS**  
Cooperative study of heavy duty diesel emission  
measurement methods  
[PB-257137/0] 13 p0133 N77-15541
- Precision insulation measurement under field  
conditions  
14 p0219 N77-19113
- MECHANICAL DEVICES**  
An assessment of mechanical energy storage for  
solar systems  
16 p0460 A77-48839
- MECHANICAL DRIVES**  
Self-starting, intrinsically controlled Stirling  
engine  
13 p0041 A77-12844
- Rotor/generator isolation for wind turbines  
[AIAA 77-372] 14 p0180 A77-25782
- Flywheel hybrid power trains. I - Component and  
drive selection. II - Numerical optimization and  
operation  
16 p0438 A77-47968
- Mechanical thermal motor  
[NASA-CASE-MFS-23062-1] 13 p0104 N77-12402
- Increased fuel economy in transportation systems  
by use of energy management: Second year's  
program. Executive summary  
[PB-256117/3] 13 p0108 N77-12536
- Mount for continuously orienting a collector dish  
in a system adapted to perform both diurnal and  
seasonal solar tracking  
[NASA-CASE-MFS-23267-1] 14 p0228 N77-20401
- MECHANICAL ENGINEERING**  
Improved engineering-economic model of residential  
energy use  
[ORNL-COR-8] 16 p0557 N77-33644
- MECHANICAL OSCILLATORS**  
Thermal oscillators --- free piston valveless  
closed cycle Stirling or Ericsson cycle thermal  
machines  
16 p0465 A77-48879
- MECHANICAL PROPERTIES**  
Fiber glass super flywheels  
14 p0157 A77-22143
- Collectors, pipelines, and heat storage units made  
of plastics  
14 p0202 A77-29567
- Consideration of encapsulants for photovoltaic  
arrays in terrestrial applications  
14 p0203 A77-29580
- Fabrication of solar energy concentrators based on  
polyurethane foams using new polyol and  
isocyanate compounds  
15 p0271 A77-32973
- Investigation of the mechanism of cleaning heating  
surfaces by the pulsation method  
[BLL-M-25448-(5828.4F)] 13 p0112 N77-13235
- MEDICAL SCIENCE**  
Dimensions, volume 61, no. 5  
[PB-267321/8] 16 p0542 N77-32027
- MELTING**  
Demand sensitive energy storage in molten salts  
16 p0491 A77-49102
- MEMBRANE STRUCTURES**  
Progress on the selective removal of H<sub>2</sub>S from  
gasified coal using an immobilized liquid membrane  
15 p0318 A77-38146
- MERCURY VAPOUR**  
Mercury emissions from geothermal power plants  
15 p0289 A77-34428
- MESAS**  
Cooperative geochemical resource assessment of the  
Mesa Geothermal system  
[PB-257225/3] 13 p0132 N77-15520
- METABOLISM**  
The palaeothermophilic origin of energy metabolism  
--- chemiosmotic precursor to phototrophism in  
estuarine cellular organisms  
13 p0064 A77-17895
- METAL AIR BATTERIES**  
Porous electrodes for Zn/air alkaline battery  
16 p0431 A77-46722
- An assessment of wind-powered generators for  
navigational aids  
16 p0468 A77-48900
- Heat transfer analysis of metal hydrides in  
metal-hydrogen secondary batteries  
14 p0239 N77-21597
- METAL COATINGS**  
A new Chrome Black selective absorbing surface ---  
for solar radiation  
16 p0406 A77-41585
- Considerations in the development of a high  
performance per unit cost solar collector  
16 p0487 A77-49067
- Fundamental studies of black chrome for solar  
collector use  
16 p0498 A77-49160
- Solar cell collector and method for producing same  
--- indium alloy coatings  
[NASA-CASE-LEW-12552-1] 14 p0211 N77-17564
- Radiative characteristics of metallic particle  
coatings and their applications in selective  
solar energy collectors  
16 p0545 N77-32587
- METAL COMPOUNDS**  
Investigation of metal fluoride thermal energy  
storage materials  
16 p0451 A77-48767
- METAL FIBERS**  
Structural heat conductivity of fiber metal wicks  
for heat pipes  
13 p0050 A77-14326
- Investigation of the effective heat conductivity  
of metal-fiber wicks for low-temperature heat  
pipes  
16 p0500 A77-49988
- METAL FILMS**  
Particulate nature of solar absorbing films - Gold  
black  
14 p0163 A77-22982
- Wavelength-selective surfaces for solar energy  
utilization  
14 p0204 A77-29583
- METAL FOILS**  
A geometrical spectral selective window --- for  
conversion of solar energy into heat  
14 p0148 A77-21793
- METAL HYDRIDES**  
An evaluation of the use of metal hydrides for  
solar thermal energy storage  
13 p0028 A77-12739

- HYCSOS - A solar heating, cooling and energy conversion system based on metal hydrides  
13 p0029 A77-12740
- Energy storage via calcium hydride production  
13 p0032 A77-12774
- Metal hydrides of improved heat transfer characteristics  
13 p0033 A77-12775
- Some useful relationships between the physical and thermodynamic properties of metal hydrides  
13 p0033 A77-12776
- Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage  
13 p0033 A77-12777
- Performance of a hydrogen-powered transit vehicle  
13 p0033 A77-12781
- A hydride compressor  
13 p0046 A77-13336
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries  
15 p0278 A77-33363
- Titanium alloy hydrides - Their properties and applications  
15 p0280 A77-33385
- A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system  
15 p0280 A77-33387
- A simple approach to metal hydride alloy optimization  
15 p0281 A77-33388
- Prototype hydrogen automobile using a metal hydride  
15 p0282 A77-33398
- Metalhydrides  
[OUEL-1146/76]  
13 p0094 A77-11158
- Metal hydrides as hydrogen storage media and their applications  
[BNL-21648]  
14 p0231 A77-20589
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries  
14 p0239 A77-21597
- A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system  
14 p0242 A77-21622
- A simple approach to metal hydride alloy optimization  
14 p0243 A77-21624
- Prototype hydrogen automobile using a metal hydride  
14 p0244 A77-21636
- METAL MATRIX COMPOSITES**  
Evaluation of potassium titanate as a component of alkaline fuel cell matrices  
[NASA-TN-D-8341]  
13 p0094 A77-11175
- METAL OXIDE SEMICONDUCTORS**  
Heterostructures for silicon solar cells  
14 p0151 A77-21817
- Open-circuit voltage of silicon solar cells  
14 p0151 A77-21820
- Technology of GaAs metal-oxide-semiconductor solar cells  
15 p0259 A77-30739
- Thermionic converter studies at Thermo Electron  
16 p0466 A77-48887
- Thermionic converter performance with oxide collectors  
16 p0466 A77-48888
- Solar cell collector and method for producing same --- indium alloy coatings  
[NASA-CASE-LEW-12552-1]  
14 p0211 A77-17564
- High-efficiency thin-film GaAs solar cells  
[PB-258493/6]  
14 p0212 A77-17599
- METAL OXIDES**  
Advanced thermionic converter development  
13 p0043 A77-12862
- Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides  
13 p0056 A77-15817
- Comparative kinetics of high-temperature reaction between H<sub>2</sub>S and selected metal oxides  
16 p0424 A77-44608
- Storage of solar energy by inorganic oxide/hydroxides  
16 p0492 A77-49109
- Reversible oxidation of metal oxides for thermal energy storage  
16 p0492 A77-49110
- Thermal efficiency of solid electrolyte fuel cells with mixed conduction  
16 p0500 A77-50199
- METAL PARTICLES**  
Black magnetic spherule fallout in the eastern Gulf of Mexico  
13 p0052 A77-14890
- Recovering metal from trash  
15 p0287 A77-33529
- METAL PLATES**  
Corrosion prevention in aluminum solar systems  
15 p0270 A77-32602
- Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier [PB-268106/2]  
16 p0543 A77-32295
- METAL SHEETS**  
Energy conditions of welding with solar radiation  
16 p0421 A77-44274
- METAL SURFACES**  
Gas release during long-term operation of heat pipes  
13 p0050 A77-14328
- Study of the electrical characteristics of the boundary layer on the metal surfaces in the channels of an open cycle MHD generator  
13 p0054 A77-15666
- The Alcoa 655 selective surface for aluminum --- for solar collectors  
16 p0487 A77-49063
- METAL VAPORS**  
Study of the properties of heat pipes with liquid-metal heat-transfer agents in low-temperature regimes  
13 p0046 A77-13243
- Measurements of Sc I gf-values --- absorption spectroscopy using heat pipe oven  
13 p0058 A77-16270
- Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe  
15 p0306 A77-36708
- METAL WORKING**  
Studies of technological processes by solar energy under cosmic simulated conditions  
[IAF PAPER 77-54]  
16 p0506 A77-51411
- METAL-GAS SYSTEMS**  
Hydrogen absorption in Ti3Al  
16 p0506 A77-51372
- Ceramic coatings for components exposed to coal-gas environments: A review  
[ANL-76-124]  
16 p0532 A77-31323
- METAL-WATER REACTIONS**  
Corrosion inhibitors for solar heating and cooling systems  
[NASA-TN-D-8409]  
14 p0210 A77-17198
- METALLIC PLASMAS**  
Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system  
15 p0331 A77-39570
- METALLOGRAPHY**  
Metal dusting corrosion in coal gasification environments  
15 p0337 A77-40042
- METALLURGY**  
Heat pipes for fluid-bed gasification of coal - Metallurgical condition of heat pipes after tests in process environment  
13 p0031 A77-12764
- Physical metallurgy of FeTi-hydride and its behavior in a hydrogen storage container  
14 p0242 A77-21620
- Energy use patterns in metallurgical and nonmetallurgical mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities)  
[PB-261150/7]  
15 p0346 A77-22644
- Energy use patterns in metallurgical and nonmetallurgical mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement  
[PB-261153/1]  
15 p0346 A77-22645
- METALS**  
The role of recycling in conservation of metals and energy  
13 p0061 A77-16825
- Thermal storage in metals  
16 p0492 A77-49105

- The electron factor in catalysis on metals electrocatalysis on non-metallic surfaces [PB-256264/3] 13 p0103 N77-12166
- Storage of thermal energy in molten salts and metals [NASA-TT-F-17412] 14 p0220 N77-19574
- Contamination of groundwater by heavy metals from the land disposal of fly ash [COO-2727-4] 15 p0357 N77-23631
- Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels [8LL-M-25473-(5828.4F)] 15 p0359 N77-24245
- Method for fabricating solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 15 p0363 N77-24593
- An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components [PB-267629/4] 16 p0531 N77-31046
- A screening for potentially critical materials for the National stockpile [PB-267214/5] 16 p0533 N77-31595
- METEOROLOGICAL CHARTS**
- Siting of wind driven apparatus 13 p0043 A77-12865
- METEOROLOGICAL PARAMETERS**
- Aspects of surface wind behaviour 14 p0165 A77-23357
- Solar powered absorption cycle simulation using real and stochastic weather data [ASME PAPER 76-WA/SOL-6] 14 p0188 A77-26511
- Meteorological data regarding the utilization of solar energy 14 p0202 A77-29563
- Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data 15 p0256 A77-30315
- Influence of atmospheric conditions on the parameters of a turbojet engine 15 p0323 A77-39270
- Meteorological effects on solar cells 15 p0338 A77-40149
- The possibility of using regression models for calculating the effect of weather conditions on electric energy demand 16 p0411 A77-42259
- The test reference year: A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun --- for heating and air conditioning systems design 16 p0441 A77-48258
- Present state and perspective of solar energy applications in Mexico 16 p0469 A77-48911
- Solar powered absorption air-conditioning system performance using real and synthetic weather data 16 p0479 A77-49002
- Climatological constraints on the development of solar energy in Canada 16 p0480 A77-49005
- Regional variations of solar radiation with application to solar energy system design [PB-259379/6] 14 p0226 N77-19708
- Regional variations of solar radiation with application to solar energy system design, user's manual [PB-259378/8] 14 p0234 N77-20676
- METEOROLOGICAL SATELLITES**
- Insolation data for solar energy conversion derived from satellite measurements of earth radiance 16 p0471 A77-48930
- METEOSAT SATELLITE**
- Flight results of a cryogenic cooler designed for Meteosat [IAF PAPER 76-210] 13 p0003 A77-10942
- METHANE**
- Solar energy collection by bioconversion 13 p0021 A77-12672
- Production of methane using offshore wind energy 13 p0026 A77-12722
- Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737
- The potential of the heat pipe in coal gasification processes 13 p0031 A77-12763
- Design studies of the hydrogasification of coal 14 p0175 A77-24214
- Methane gas recovery from sanitary landfills in Southern California 14 p0182 A77-26077
- Current status of the BI-GAS process 14 p0193 A77-27300
- Combined utilization of nuclear and organic fuels 15 p0272 A77-33159
- The manufacture of hydrogen from coal 15 p0275 A77-33337
- Direct production of methane and benzene from coal 15 p0306 A77-36766
- Fuel gas from landfill 15 p0314 A77-37661
- The conversion of ocean farm kelp to methane and other products 15 p0314 A77-37662
- An economic assessment of fuelgas from water hyacinths 15 p0314 A77-37663
- Gas production from micro algae 15 p0314 A77-37665
- Packed bed digestion of solid wastes 15 p0323 A77-39107
- Methane production from solid waste 16 p0434 A77-47218
- Anaerobic sludge digestion - A potential energy source 16 p0439 A77-47970
- Utilizing methane from coalbeds 16 p0444 A77-48710
- Methane production through bioconversion of agriculture residues 16 p0489 A77-49081
- Heat treatment of refuse for increasing anaerobic biodegradability [PB-252924/6] 13 p0101 N77-11577
- A fermentation process for converting plant materials into methane 13 p0121 N77-14583
- Bibliography on Liquefied Natural Gas (LNG) safety [NASA-TM-X-73408] 13 p0127 N77-15208
- Biosolar production of fuels from algae [UCRL-52177] 16 p0511 N77-28323
- Heat treatment of refuse for increasing anaerobic biodegradability 16 p0550 N77-32995
- Systems studies of energy conservation: Methane produced from coalbeds, volume 1 [MERC/CB-77/4-VOL-1] 16 p0558 N77-33660
- METHODOLOGY**
- Methodology for the analysis of the impacts of electric power production in the West [LA-6720-PB] 16 p0533 N77-31428
- METHYL ALCOHOLS**
- Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process 13 p0023 A77-12691
- Alternate fuels for road vehicles of the future 13 p0051 A77-14584
- Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts --- for fuel cells 14 p0176 A77-24568
- Mobil process for the conversion of methanol to gasoline 14 p0193 A77-27299
- Methanol - A clean burning fuel for automobile engines 14 p0205 A77-29930
- Methanol gasoline blends - Future automotive fuels 15 p0273 A77-33300
- Methanol, past, present, and speculation on the future --- manufacture techniques and fuel applications 15 p0289 A77-34114
- In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures 16 p0440 A77-48173
- Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine 16 p0444 A77-48706



- Irreversibilities, heat penalties, and economics for the methanol/sulfuric acid process --- for hydrogen production 16 p0457 A77-48814
- Methanol from coal fuel and other applications [ORAU-126] 13 p0094 A77-11200
- Liquid phase methanol [PB-257615/5] 14 p0212 A77-17594
- Methanol engine: A transpiration strategy for the post-petroleum era [UCRL-52041] 14 p0219 A77-19469
- Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory [PB-262980/6] 15 p0356 A77-23619
- Methanol-air batteries [AD-A035942] 15 p0375 A77-25675
- Experimental results using methanol and methanol/gasoline blends as automotive engine fuel [BERC/RI-76/15] 15 p0389 A77-27245
- Methanol as automotive fuel. Part 1: Straight methanol [CONF-750264-1] 15 p0389 A77-27246
- MEXICO**
- Present state and perspective of solar energy applications in Mexico 16 p0469 A77-48911
- MICHIGAN**
- Application study of wind power technology to the city of Hart, Michigan [COO-2603-1] 14 p0212 A77-17582
- Photovoltaic-powered refrigerator experiment at Isle Royale National Park [NASA-TM-73703] 15 p0390 A77-27497
- Report of the Advisory Commission on Electric Power Alternatives [PB-268479/3] 16 p0559 A77-33668
- MICROBEAMS**
- Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies [AD-A034995] 15 p0377 A77-26491
- MICROBIOLOGY**
- The origin of the oil sand bitumens of Alberta - a chemical and a microbiological simulation study 16 p0438 A77-47765
- Microbial hydrogen production 14 p0239 A77-21601
- MICROELECTRONICS**
- Miniature applications for photovoltaic generators 14 p0155 A77-21853
- The 275 deg C microcircuitry: Resistors, capacitors, conductors, substrates, and bonding [SAND-76-0611] 15 p0389 A77-27312
- MICROMETEORITES**
- Black magnetic spherule fallout in the eastern Gulf of Mexico 13 p0052 A77-14890
- MICROORGANISMS**
- Feasibility studies of a biochemical desulfurization method --- using microorganisms as agent from high sulfur containing petroleum 14 p0170 A77-23562
- Gas production from micro algae 15 p0314 A77-37665
- MICROPROCESSORS**
- Microcomputer processor for monitoring of solar heated buildings 16 p0481 A77-49015
- MICROSEISMIS**
- Geothermal exploration: An evaluation of the microseismic groundnoise method [PB-262575/4] 15 p0343 A77-22603
- MICROWAVE ANTENNAS**
- Antenna design for offshore satellite links 16 p0442 A77-48493
- The assembly of large structures in space --- radio astronomy telescope and microwave antenna 16 p0524 A77-29770
- MICROWAVE CIRCUITS**
- New modes of operation for avalanche diodes - Frequency multiplication and upconversion 13 p0049 A77-14261
- MICROWAVE EQUIPMENT**
- Captation and concentration of solar energy 13 p0074 A77-19063
- A microwave energy converter with a reversing magnetic field 14 p0139 A77-21154
- MICROWAVE OSCILLATORS**
- High-efficiency and high-peak-power InP transferred-electron oscillators 15 p0289 A77-34366
- MICROWAVE RADIONETTERS**
- Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories 16 p0433 A77-47201
- MICROWAVE TRANSMISSION**
- Microwave transmission system for space power 13 p0014 A77-11818
- Satellite solar power stations and energy relay satellites 13 p0052 A77-14901
- Perspectives on Satellite Solar Power [AIAA PAPER 77-352] 13 p0066 A77-18257
- Solar power from satellites 14 p0146 A77-21751
- Alternative approaches to space-based power generation 14 p0199 A77-29066
- The development of a satellite solar power station 14 p0203 A77-29577
- Microwave energy transmission [AIAA PAPER 77-540] 15 p0266 A77-32063
- Assessment of satellite power stations [AIAA PAPER 77-552] 15 p0266 A77-32069
- Solar power in space - Energy for the year 2000 16 p0399 A77-40519
- Transmission of power from space to earth [AIAA 77-1026] 16 p0404 A77-41566
- Solar satellites - Space key to our power future 16 p0413 A77-42560
- New options for satellite power systems /SPS/ [AIAA PAPER 77-1028] 16 p0419 A77-43392
- Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere 16 p0464 A77-48875
- Anik B, the new Canadian domestic satellite 16 p0499 A77-49249
- Space-to-earth power transmission system [NASA-TM-X-73489] 13 p0105 A77-12517
- Statistics of the radiated field of a space-to-earth microwave power transfer system [NASA-TM-X-73684] 16 p0526 A77-30314
- Survey of satellite power stations [DSE/2071-1] 16 p0532 A77-31225
- MICROWAVES**
- Space power systems - What environmental impact 14 p0146 A77-21757
- MIDLATITUDE ATMOSPHERE**
- Energetics of the midlatitude thermosphere 13 p0012 A77-11492
- MILITARY AIRCRAFT**
- The military utility of very large airplanes and alternative fuels 16 p0434 A77-47271
- MILITARY OPERATIONS**
- Fuels and lubricants --- an evaluation of military fuels and lubricants [AD-A032842] 15 p0359 A77-24314
- A summary of the DARPA energy and materials shortages programs, fiscal years 1972-1976 [AD-A036021] 15 p0375 A77-25677
- MILITARY TECHNOLOGY**
- Prerequisites for military/civilian geopressured geothermal resource development 13 p0031 A77-12761
- LTA - Recent developments --- Lighter Than Air ships 13 p0061 A77-17021
- Photovoltaic systems --- solar energy conversion research for military applications 15 p0288 A77-34112
- Solar electricity for military applications 15 p0289 A77-34113
- The potential of liquid hydrogen as a military aircraft fuel [AD-A026666] 13 p0118 A77-14272
- Dual purpose nuclear power plants for military installations [AD-A026141] 13 p0132 A77-15521
- Solar heating retrofit of military family housing [AD-A030843] 14 p0226 A77-19659
- Advanced engine design concepts and their influence on the performance of multi-role combat aircraft 15 p0339 A77-22116

# MINERAL DEPOSITS

# SUBJECT INDEX

- Operation of military field heating equipment using solid fuels [AD-A037121] 15 p0388 N77-27152
- Alternate petroleum based fuels for naval fleet usage: potential availability, cost, and system impact [AD-A041980] 16 p0551 N77-33372
- DoD energy R and D. Part 2: Military fuel operations. Performance and R and D implications [AD-A042272] 16 p0554 N77-33617
- MINERAL DEPOSITS**
- World oil resources. III - The geological analogy method 13 p0012 A77-11341
- World petroleum resources. IV - Probabilistic methods 13 p0012 A77-11342
- The shaping of our needs in mineral raw materials and sources for meeting those needs --- Hungarian survey 13 p0017 A77-12246
- Recovery of inaccessible coal reserves by in situ gasification 13 p0022 A77-12686
- In situ recovery of oil and minerals from Piceance Creek Basin oil shale 13 p0023 A77-12694
- Assessing low sulfur coal resources in Montana and Wyoming 13 p0058 A77-16374
- The Asphalt Ridge tar-sand deposits 14 p0193 A77-27347
- Recovery of bitumen from oil-impregnated sandstone deposits of Utah 14 p0194 A77-27349
- Underground gasification --- of coal for deep deposit in situ processing 15 p0308 A77-36813
- Calcite-aragonite deposition in geothermal wells 16 p0418 A77-43025
- The supply of coal in the long run: The case of eastern deep coal [PB-252642/4] 13 p0086 N77-10626
- Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game [PB-255607/4] 13 p0105 N77-12502
- The exploration, development and production of Naval petroleum reserve number 4 [PB-256714/7] 13 p0113 N77-13516
- A framework for assessing environmental impacts of possible Antarctic mineral development, part 1 [PB-262750/3] 15 p0368 N77-24709
- Space technology in the discovery and development of mineral and energy resources 16 p0526 N77-30289
- Computer graphics demonstration: Area coal availability studies [PB-267923/1] 16 p0541 N77-31824
- Mineral resources: Potentials and problems [USGS-CIRC-698] 16 p0544 N77-32563
- MINERAL EXPLORATION**
- Energy analysis in modelling 13 p0007 A77-11047
- MINERAL OILS**
- The Asphalt Ridge tar-sand deposits 14 p0193 A77-27347
- Field experiment of in-situ oil recovery from a Utah tar sand by reverse combustion 14 p0193 A77-27348
- MINERALS**
- Minerals in the US economy: Ten-year supply-demand profiles for mineral and fuel commodities [PB-252594/9] 13 p0085 N77-10624
- The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 --- Bolivia. [E77-10028] 13 p0096 N77-11491
- Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico [E77-10090] 14 p0214 N77-18511
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities) [PB-261150/7] 15 p0346 N77-22644
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement [PB-261153/1] 15 p0346 N77-22645
- United States special format report: Performance of the Sohio Solar Water Heating System using large area plastic collectors (Grants, New Mexico) [SAN/1038-76/1] 15 p0365 N77-24606
- An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components [PB-267629/4] 16 p0531 N77-31046
- MINES (EXCAVATIONS)**
- The economics of coal supply - The state of the art 13 p0013 A77-11523
- Underground gasification offers clean safe route to coal energy 14 p0184 A77-26292
- Underground gasification of coal 14 p0198 A77-28759
- Electrobiological neutralization of acid mine water 16 p0420 A77-43651
- Acid mine drainage - The problem and the solution 16 p0425 A77-45125
- Utilizing methane from coalbeds 16 p0444 A77-48710
- Underground coal mining: An assessment of technology [PB-255726/2] 13 p0093 N77-10974
- Development of fuel cell CO detection instruments for use in a mine atmosphere [PB-254823/8] 13 p0095 N77-11380
- Degasification and production of natural gas from an airshaft in the Pittsburgh coalbed [PB-258101/5] 14 p0210 N77-17555
- Size distribution and mass output of particulates from diesel engine exhausts [PB-261416/2] 15 N77-22732
- Comprehensive ground control study of a mechanized longwall operation. Volume 2: Special reports. 1: Physical properties of coal and coal measure rocks. 2: Bearing capacity of roof and floor rocks. 3: Response of borehole pressure cells. 4: Installation of subsurface instrumentation [PB-262476/5] 15 p0368 N77-24711
- Evaluation of current surface coal mining overburden handling techniques and reclamation practices [PB-264111/6] 15 p0372 N77-25625
- Borehole hydraulic coal mining system analysis [NASA-CR-154119] 16 p0512 N77-28558
- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] 16 p0527 N77-30589
- Alluvial valley floors in east-central Montana and their relation to strippable coal reserves. A reconnaissance report [PB-267280/6] 16 p0540 N77-31725
- Underground coal mine instrumentation and test [NASA-CR-150045] 16 p0551 N77-33479
- MINICOMPUTERS**
- Large scale scientific computation via minicomputer [PB-267575/9] 16 p0541 N77-31823
- MINING**
- Recovery of inaccessible coal reserves by in situ gasification 13 p0022 A77-12686
- Effects of coal mining on ground and surface water quality, Monongalia County, West Virginia 16 p0400 A77-41211
- Applying computer-drawn maps of geologic data to analysis of mining problems [PB-255497/0] 13 p0096 N77-11518
- Evaluation of combined in-situ and surface retorting of oil shale tract C-b [PB-261064/0] 15 p0347 N77-22646
- Evaluation of current surface coal mining overburden handling techniques and reclamation practices [PB-264111/6] 15 p0372 N77-25625
- Physical properties of western coal waste materials [PB-266724/4] 16 p0530 N77-30657
- Underground coal mine instrumentation and test [NASA-CR-150045] 16 p0551 N77-33479

- Systems studies of energy conservation: Methane produced from coalbeds, volume 1 [NEEC/CR-77/4-VOL-1] 16 p0558 N77-33660
- MINORITY CARRIERS**  
Increase of diffusion lengths of minority carriers under the effect of a width gradient of the forbidden band 14 p0151 A77-21823
- A minority carrier MIS solar cell 15 p0288 A77-33799
- MIRRORS**  
Performance of two fixed-mirror solar concentrators for process heat 13 p0074 A77-19065
- Cylindrical mirror collector field 13 p0074 A77-19071
- Efficiency tests on a linear parabolic concentrator for medium and high temperatures 13 p0077 A77-19103
- Investigation of composite radiant-energy concentrators with conical radiation sources 14 p0143 A77-21313
- Geometric katoptrics - Applications to solar energy 14 p0166 A77-23383
- Concentrating power of spherical facets 14 p0179 A77-25357
- Cost optimal deployment of mirrors associated with a high temperature solar energy system 14 p0181 A77-25901
- Concentration of scattered radiation --- by solar collectors 15 p0316 A77-37768
- Analysis of a faceted concentration system 15 p0316 A77-37769
- Concentrating capability of spherical facets --- for solar concentrator applications 16 p0409 A77-41907
- Design of pointed solar concentrators 16 p0417 A77-42954
- Concentration of diffuse radiation --- by solar collectors 16 p0437 A77-47424
- Analyzing multifacet concentrating systems --- solar energy application 16 p0437 A77-47425
- Development status of the fixed mirror solar concentrator 16 p0460 A77-48834
- Reflection coefficient for a back-surface glass mirror --- of solar collectors 16 p0488 A77-49072
- Heat mirror - A practical alternative to the selective absorber 16 p0488 A77-49075
- Georgia Tech high temperature solar test facility 16 p0500 A77-49745
- Optical study of fixed spherical solar collectors 16 p0505 A77-51161
- Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber [SAND-76-8663] 14 p0248 N77-21674
- Potential of a solar collector with a stationary spherical reflector and a tracking absorber for electrical power production [SAND-76-8039] 15 p0345 N77-22636
- Field-reversed mirror as a D-T power reactor [UCRL-78082] 15 p0351 N77-22967
- MIS (SEMICONDUCTORS)**  
MIS silicon solar cells 13 p0001 A77-10174
- Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818
- Improving MIS silicon solar cells by HF-treatment of the insulating oxide layer 14 p0151 A77-21819
- Open-circuit voltage of silicon solar cells 14 p0151 A77-21820
- Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038
- Tunnel MIS solar cells 14 p0163 A77-22979
- A minority carrier MIS solar cell 15 p0288 A77-33799
- Factors which maximize the efficiency of Cr-p-Si Schottky/MIS/ solar cells 15 p0288 A77-34103
- MIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective coating 16 p0499 A77-49494
- Model calculations for metal-insulator-semiconductor solar cells 16 p0500 A77-50050
- Cast polycrystalline silicon Schottky-barrier solar cells 16 p0503 A77-50295
- MISALIGNMENT**  
Effect of angular misorientation on the performance of conical, spherical and parabolic solar concentrators 16 p0502 A77-50221
- MISSILE DESIGN**  
Performance optimization of an air-to-air missile design 15 p0289 A77-34298
- MISSILES**  
Electrochemical battery trends for aircraft and missile applications [ATAA PAPER 77-481] 14 p0172 A77-23901
- MISSION PLANNING**  
The space station and space industrialization [AAS 76-050] 16 p0430 A77-46633
- Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923
- MODAL RESPONSE**  
New modes of operation for avalanche diodes - Frequency multiplication and upconversion 13 p0049 A77-14261
- MODELS**  
Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy [PB-255696/7] 13 p0100 N77-11561
- A simplified equilibrium model of the US energy-economic system and its use in comparing alternatives 14 p0247 N77-21662
- WATSON: A solar heating simulation and economic evaluation program** [NP-21307] 15 p0364 N77-24603
- Will a rapidly expanding power-generating system be part of the energy problem or part of its solution [UCRL-78500] 15 p0381 N77-26651
- Project Independence Evaluation System (PIES) documentation. Volume 7: Methodology for developing more complex investment and production profiles in the FEA oil and gas supply model [PB-264649/5] 16 p0516 N77-28607
- Analysis of energy projections for infrastructure development requirements [PB-266419/1] 16 p0524 N77-29640
- Research and development in enhanced oil recovery. Part 3: The methodology [ERDA-77-20/3] 16 p0538 N77-31651
- Comparative state-of-the-art assessment of gas supply modeling [EPRI-EA-201] 16 p0539 N77-31656
- An economic model of new crude oil and natural gas supplies in the lower 48 states 16 p0552 N77-33596
- Improved engineering-economic model of residential energy use [ORNL-COR-8] 16 p0557 N77-33644
- MODULAR INTEGRATED UTILITY SYSTEM**  
Wide-range control of a thermal interconnection network --- waste incineration utilization supplying pipelined steam heat 14 p0145 A77-21545
- Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility 15 p0271 A77-32800
- Technical and economic aspects of industrial power-heat coupling. I 15 p0334 A77-39674
- Investigation into the use of large-scale total-energy systems in mild and warm climates 16 p0401 A77-41318
- Energy conservation by symbiosis 16 p0408 A77-41852
- The 'wind-wall' - An integrated wind/solar system 16 p0410 A77-42075

## MODULES

## SUBJECT INDEX

MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems  
[ORNL-HUD-MIUS-6] 14 p0249 N77-21684

Design techniques for modular integrated utility systems --- energy production and conversion efficiency  
[NASA-TM-X-58189] 14 p0253 N77-22005

Program document for Energy Systems Optimization Program 2 (ESOP2). Volume 1: Engineering manual  
[NASA-CR-151422] 15 p0372 N77-25631

Preliminary design study of a baseline MIUS  
[NASA-TM-X-58193] 16 p0561 N77-34050

**MODULES**  
Smith multimodule solar-electric plant  
16 p0482 A77-49023

**MOJAVE DESERT (CA)**  
Wind power prediction models  
[NASA-CR-149235] 13 p0105 N77-12509

**MOLECULAR FLOW**  
Molecular gas performance of a disk generator with swirl  
15 p0326 A77-39534

**MOLECULAR GASES**  
Conversion of solar energy by photosynthetic production of molecular hydrogen  
14 p0143 A77-21316

**MOLECULAR INTERACTIONS**  
Exploration of molecular sieve zeolites for the cooling of building with solar energy  
[PB-266055/3] 16 p0517 N77-28620

**MOLECULAR STRUCTURE**  
Fractionation and structural characterization of coal liquids  
13 p0069 A77-18582

**MOLECULAR THEORY**  
Report of the subcommittee on energy-related atomic and molecular science  
[PB-264052/2] 15 p0375 N77-25673

**MONITORS**  
Microcomputer processor for monitoring of solar heated buildings  
16 p0481 A77-49015

Monitoring fluid flow by using high-frequency electromagnetic probing  
[UCRL-51579] 13 p0120 N77-14393

Design modification of Pemco Model 702909 wireless ground monitor --- for use in strip mining  
[PB-262858/4] 15 p0360 N77-24371

Design of minimum-weight diffusion batteries  
[PB-266217/9] 16 p0518 N77-28645

**MONTANA**  
Assessing low sulfur coal resources in Montana and Wyoming  
13 p0058 A77-16374

Alluvial valley floors in east-central Montana and their relation to strippable coal reserves. A reconnaissance report  
[PB-267280/6] 16 p0540 N77-31725

**MORPHOLOGY**  
Morphological analysis as a design aid: An application to solar energy conversion processes --- French book  
16 p0429 A77-46467

**MOSAICS**  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121

**MOTOR VEHICLES**  
Alternate fuels for road vehicles of the future  
13 p0051 A77-14584

Wind tunnel investigation of devices to reduce bus aerodynamic drag  
[AIAA PAPER 77-367] 13 p0066 A77-18232

Hybrid propulsion system for motor vehicles with predominantly intermittent mode of operation  
14 p0171 A77-23900

Hybrid drive with kinetic energy store as vehicle drive  
[UCRL-TRANS-11018] 13 p0120 N77-14486

Increased fuel economy in transportation systems by use of energy management - second year's program  
[PB-257177/6] 13 p0133 N77-15930

A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car  
14 p0240 N77-21612

Hydrogen storage on highway vehicles: Update 1976  
14 p0242 N77-21614

Hydrogen vehicular fuel storage as a step in a water splitting cycle  
14 p0242 N77-21615

Hydrogen-powered highway vehicles: Applications and optimum form of fuel storage  
14 p0242 N77-21616

Methods of on-board generation of hydrogen for vehicular use  
14 p0242 N77-21617

Dynamic tests of hydrogen-powered IC engines --- for mass transit vehicles  
14 p0244 N77-21633

Evaluation of rail rapid transit and express bus service in the urban commuter market  
[PB-265236/0] 15 p0398 N77-28046

Overview and review of motor gasoline desulfurization, volume 1  
[BERC/RI-76/17-VOL-1] 16 p0551 N77-33377

Motor gasoline desulfurization study, volume 2  
[BERC/RI-76/17-VOL-2] 16 p0551 N77-33378

**MOTORS**  
Mechanical thermal motor  
[NASA-CASE-MPS-23062-1] 13 p0104 N77-12402

**MULTIPHASE FLOW**  
Pressure drawdown and buildup analyses in geothermal reservoirs  
13 p0030 A77-12753

**MUONS**  
Muon catalysed fusion for pellet ignition  
13 p0012 A77-11468

## N

**N-TYPE SEMICONDUCTORS**  
Technology of GaAs metal-oxide-semiconductor solar cells  
15 p0259 A77-30739

The theory of hydrogen production in a photoelectrochemical cell  
15 p0279 A77-33370

N-indium tin oxide/p-indium phosphide solar cells  
15 p0317 A77-38049

Theoretical treatment of the photoelectrochemical production of hydrogen --- semiconductor electrode for solar applications  
15 p0321 A77-38530

Analysis of the fill factor for n-CdS/p-CdTe solar cells  
16 p0402 A77-41433

Efficient sprayed In2O3:Sn n-type silicon heterojunction solar cell  
16 p0503 A77-50292

Effectiveness of heat-emitting coatings with variable degree of blackness  
13 p0111 N77-12893

**NAPHTHALENE**  
Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures  
16 p0412 A77-42906

Impact of fuel properties on jet fuel availability  
[AD-A029493] 14 p0219 N77-19278

**NASA PROGRAMS**  
Energy - Ecospace --- space law aspects of U.S. and U.S.S.R. solar power proposals  
[IAF PAPER ISL-76-59] 13 p0004 A77-10970

NASA thermionic-conversion program  
13 p0043 A77-12863

NASA electric propulsion program  
[AIAA PAPER 76-1068] 13 p0045 A77-13033

Status of the NASA Space Power Program  
[AIAA PAPER 77-505] 14 p0173 A77-23922

The NASA Hydrogen Energy Systems Technology study - A summary  
15 p0284 A77-33413

The NASA Energy Conservation Program  
[AIAA PAPER 77-1005] 16 p0405 A77-41571

Aerospace and HVACER: Spinoff '77 - Reaping the dividends --- Heating, Ventilation, Air Conditioning, and Refrigeration  
16 p0427 A77-45918

Space and energy; Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975  
16 p0432 A77-46787

The NASA thermionic-conversion /TEC-ART/ program  
16 p0438 A77-47960

NASA Thermionic-Conversion program  
16 p0466 A77-48886

## SUBJECT INDEX

## NATURAL GAS

- Synchronization of the ERDA-NASA 100 Kw wind turbine generator with large utility networks  
[NASA-TM-X-73613] 14 p0220 N77-19580
- Space Benefits: The secondary application of aerospace technology in other sectors of the economy  
[NASA-CR-152685] 15 p0352 N77-23010
- NASA Quiet Clean General Aviation Turbofan (QCGAT) program status  
[NASA-TM-X-73564] 15 p0353 N77-23109
- JPL basic research review --- research and advanced development  
[NASA-CR-152689] 15 p0357 N77-23894
- NASA authorization, 1978, volume 1, part 2  
[GPO-92-082] 16 p0542 N77-32031
- NASA authorization, 1978, volume 1, part 3  
[GPO-92-294] 16 p0542 N77-32032
- Spinoff 1977: An annual report  
[NASA-TM-74908] 16 p0561 N77-34049
- NATURAL GAS**
- Energy and the gas industry 13 p0005 A77-11032
- Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance 13 p0020 A77-12657
- Solar SNG - Large-scale production of SNG by anaerobic digestion of specially grown plant matter --- Synthetic Natural Gas 13 p0021 A77-12671
- Catalytic coal gasification for SNG production --- Synthetic Natural Gas 13 p0022 A77-12683
- The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements 13 p0028 A77-12735
- The minimum combustion gas recirculation ratio for fuel gas conversion in a MHD cycle 14 p0157 A77-22552
- On the production of town gas from off-gases of the chemical processing industry 14 p0164 A77-23099
- Environmental considerations of converting fossil-fueled power plants from oil or natural gas to coal 14 p0181 A77-26043
- Gas-fired heat pumps - An emerging technology 14 p0195 A77-27891
- Unconventional petroleum and natural gas resources. II - Additional gas resources 14 p0198 A77-28760
- New hydrogen process is in the works 14 p0205 A77-29789
- Gas economy - Gas technology --- energy supply and utilization 15 p0263 A77-31576
- The role of gas utilization in environmental protection 15 p0265 A77-31849
- Synthesis of substitute natural gas on the basis of coal 15 p0268 A77-32249
- Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply 15 p0272 A77-33170
- Economics of crude oil and natural gas - Cost of adding production 15 p0300 A77-36327
- Fuel gas production via Koppers-Totzek gasification - An economic analysis 15 p0301 A77-36336
- Approaches to extracting potentially recoverable hydrocarbons --- nuclear explosive mining of natural gas and crude oil 15 p0322 A77-38786
- Wolfersberg - A subterranean storage place for natural gas at a depth of 3000 m 15 p0334 A77-39669
- Natural gas storage in salt caverns 15 p0334 A77-39670
- The supply of the Federal Republic of Germany and Western Europe with energy, giving particular consideration to the oil and gas potential of the North Sea 15 p0334 A77-39673
- Hydrocarbon deposits beyond the shelf edge of the oceans 16 p0400 A77-40682
- Hydrogen by electrolysis to supplement pipeline gas supplies Technical and economic aspects  
[AIChE 77-1032] 16 p0405 A77-41569
- Helicopter offshore operations --- oil and gas exploration and production 16 p0421 A77-44437
- Testing the annular combustor of the NK-8 aero-engine on natural gas --- for stationary gas turbine installation 16 p0426 A77-45325
- Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation 16 p0439 A77-48092
- Utilizing methane from coalbeds 16 p0444 A77-48710
- Helium resources of the United States, 1973  
[PB-252473/4] 13 p0085 N77-10623
- The long-run marginal costs of energy  
[PB-252504/6] 13 p0085 N77-10625
- Burner design criteria for control of NOx from natural gas combustion. Volume 1: Data analysis and summary of conclusions  
[PB-254167/0] 13 p0091 N77-10686
- User's guide to petroleum industry survey data type  
[PB-256635/4] 13 p0098 N77-11544
- Isotopic characterization of Illinois natural gas 13 p0113 N77-13484
- Burner design criteria for control of NOx from natural gas combustion. Volume 2: Raw data and experimental results  
[PB-256806/1] 13 p0115 N77-13549
- Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10C90] 14 p0214 N77-18511
- Development of an assessment methodology for geopressured zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in South Texas  
[COO-2687-4] 14 p0215 N77-18564
- Relationship of energy growth to economic growth under alternative energy policies  
[BNL-50500] 14 p0223 N77-19620
- Analysis of natural gases, 1975  
[PB-259351/5] 14 p0228 N77-20197
- The spatial characteristics of three Wyoming fuels  
[AD-A030873] 14 p0233 N77-20612
- Economics of a freeze desalting process using cold seawater effluent of a liquid natural gas plant  
[PB-259272/3] 14 p0234 N77-20656
- Projected natural gas curtailments and potential needs for additional alternate fuels, 1976-1977 heating season 14 p0235 N77-21257
- Technical prospects for commercial and residential distribution and utilization of hydrogen 14 p0245 N77-21642
- Preliminary investigation. Nonproducing gas reserves onshore United States and in the Gulf of Mexico offshore state area, as reported in Federal Commission form 15  
[PB-263434/3] 15 p0355 N77-23597
- The phasing out of natural gas and oil for electric power generation, southwest power pool and Electric Reliability Council of Texas. Part 2: Technical and economic evaluation of various possible electric utility natural gas reduction programs, 1975 - 1990  
[PB-263505/0] 15 p0356 N77-23617
- The future of natural gas: Economic myths, regulatory realities  
[PB-263625/6] 15 p0356 N77-23621
- Incremental pricing of supplemental gas  
[PB-263689/2] 15 p0360 N77-24319
- The gas supplies of interstate natural gas pipeline companies, 1975  
[PB-263598/5] 15 p0360 N77-24320
- Development of an assessment methodology for geopressurized zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in south Texas  
[COO-2687-5] 15 p0361 N77-24571
- Future natural gas supply to the Northeast  
[BNL-50558] 15 p0364 N77-24595

- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 1  
[PB-264705/5] 15 p0383 N77-26677
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2  
[PB-264706/3] 15 p0385 N77-26693
- Energy industry investigation. Part 1: Joint ventures  
[GPO-72-530] 15 p0391 N77-27499
- Energy and US agriculture. 1974 data base, volume 1. Part A: US series of energy tables. Part B: State series of energy tables  
[PB-264449/0] 15 p0395 N77-27562
- National gas flow patterns 1975: Geographic flow patterns and intercompany relationships  
[PB-266111/4] 16 p0512 N77-28328
- Project Independence Evaluation System (PIES) documentation. Volume 6: Methodology for improving the price sensitivity of the PIES oil and gas supply curves  
[PB-264069/6] 16 p0516 N77-28606
- Project Independence Evaluation System (PIES) documentation. Volume 7: Methodology for developing more complex investment and production profiles in the PEA oil and gas supply model  
[PB-264649/5] 16 p0516 N77-28607
- Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5] 16 p0516 N77-28610
- PEA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers  
[PB-265706/2] 16 p0517 N77-28615
- National gas survey. Report to the federal power commission by the Supply-Technical Advisory Committee Study Subgroup on reserves and resources classifications  
[PB-265878/9] 16 p0519 N77-29324
- Project Independence Evaluation System (PIES) documentation. Volume 9: Allocation of exploratory activity to oil and natural gas in the PEA oil and gas supply model  
[PB-265772/4] 16 p0519 N77-29325
- Project Independence Evaluation System (PIES) documentation. Volume 8: Methodology for enabling the PIES oil and gas supply curves to respond to non-constant prices  
[PB-265086/9] 16 p0523 N77-29630
- Forecast of likely US energy supply/demand balances for 1985 and 2000, and implications for US energy policy  
[PB-266240/1] 16 p0523 N77-29633
- Analysis of energy projections for infrastructure development requirements  
[PB-266419/1] 16 p0524 N77-29640
- The relation between isotopic composition of argon and carbon in natural gases  
[NASA-TM-75134] 16 p0531 N77-30680
- PEA: Final reports on oil and gas resources, reserves, and productive capacities  
[GPO-80-748] 16 p0534 N77-31606
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California  
[UCRL-52180] 16 p0536 N77-31628
- Natural gas massive hydraulic fracture research and advanced technology project  
[SAND-76-0723] 16 p0536 N77-31630
- Comparative state-of-the-art assessment of gas supply modeling  
[EPRI-PA-201] 16 p0539 N77-31656
- Study of electric and gas utilities and the public service commission of Nevada  
[PB-268481/9] 16 p0547 N77-32605
- An economic model of new crude oil and natural gas supplies in the lower 48 states  
16 p0552 N77-33596
- NAVIGATION AIDS**
- An assessment of wind-powered generators for navigational aids  
16 p0468 A77-48900
- Laboratory evaluation of solar power units for marine aids to navigation  
[AD-A034987] 15 p0375 N77-25672
- NAVIGATION SATELLITES**
- Space: A resource for earth - An AIAA review --- Book  
15 p0269 A77-32440
- NEODYMIUM LASERS**
- Status of large neodymium glass lasers  
14 p0168 A77-23503
- Analysis of the sun pumped laser cone optics  
[AD-A034284] 15 p0361 N77-24483
- NETHERLANDS**
- Hydrogen in the energy system of the Netherlands  
15 p0285 A77-33420
- Energy prospects in the Netherlands  
15 p0307 A77-36801
- Hydrogen in the energy system of The Netherlands  
14 p0247 N77-21660
- NETWORK ANALYSIS**
- The influence of parameter dispersion of electrical cells on the array power output  
16 p0420 A77-44264
- Quasi-analog models of large systems of algebraic equations  
16 p0433 A77-46959
- Idealization of complex dynamic systems with examples involving electrical energy systems --- Russian book  
16 p0434 A77-47331
- Penetration analysis and margin requirements associated with large-scale utilization of solar power plants  
[PB-257546/2] 14 p0208 N77-16459
- NEUTRAL BEAMS**
- Supplementary plasma heating studies in the atomic energy commission, France  
13 p0064 A77-17819
- Possibility of medium energy neutral beam injection into stellarator reactor  
14 p0184 A77-26093
- Update on the development of 120-keV multi-megawatt neutral beam source  
15 p0335 A77-39749
- Neutral injection at PPPL, past and present --- in toroidal plasma devices  
16 p0407 A77-41698
- Neutral beam energy and power requirements for the next generation of tokamaks  
[ERDA-76-77] 14 p0213 N77-17883
- NEUTRAL PARTICLES**
- Heating of the Frascati Tokamak by means of quasi perpendicular neutral injection  
16 p0407 A77-41706
- NEUTRON EMISSION**
- A possible correlation of the neutron yield to the electromechanic work in Mather-type plasma focus devices  
13 p0061 A77-17017
- NEVADA**
- Geothermal studies in northern Nevada  
13 p0029 A77-12742
- Study of electric and gas utilities and the public service commission of Nevada  
[PB-268481/9] 16 p0547 N77-32605
- NEW ENGLAND (US)**
- New England wind power...coastal or mountain  
13 p0058 A77-16250
- Solar heating in northern New England  
16 p0477 A77-48980
- Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions  
16 p0490 A77-49091
- Solid waste as an energy source for the northeast  
[BNL-50559] 15 p0352 N77-23012
- Energy situation in New England  
[BNL-50580] 15 p0381 N77-26650
- Briefing book on the energy situation in New England  
[BNL-21918] 16 p0515 N77-28599
- NEW HAMPSHIRE**
- Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire  
[PB-254179/5] 13 p0091 N77-10687
- Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire  
[AD-A031803] 14 p0228 N77-20393

## NEW MEXICO

- Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10090] 14 p0214 N77-18511
- Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- Shallow solar ponds for industrial process heat: The ERDA-SOHIO project  
[UCRL-78288] 14 p0232 N77-20601
- United States special format report: Performance of the Schio Solar Water Heating System using large area plastic collectors (Grants, New Mexico)  
[SAN/1038-76/1] 15 p0365 N77-24606
- Solar radiation availability for New Mexico  
[SAND-77-0004] 16 p0558 N77-33654

## NEW YORK

- Hydrogen cycle peak-shaving on the New York State Grid using fuel cells  
14 p0199 A77-29094
- Electric energy alternatives appraisal for New York State  
16 p0413 A77-42632
- Electric energy supply alternatives for New York. Phase 2: An appraisal of electrical energy alternatives available to the State of New York  
[PB-249887/4] 13 p0101 N77-11575
- An analysis of the feasibility of windmills for power generation in New York State  
[RPT-TA-17] 15 p0380 N77-26638
- Solar energy applications and related legislation  
[PB-267901/7] 16 p0539 N77-31666

## NEW ZEALAND

- Wave power --- potentially available in New Zealand  
16 p0418 A77-43011

## NICKEL

- Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films --- of solar collectors  
16 p0502 A77-50281

## NICKEL ALLOYS

- Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems  
13 p0064 A77-18019
- A new family of hydrogen storage alloys based on the system nickel-mischmetal-calcium  
16 p0457 A77-48817
- Proceedings of 2nd Workshop on Materials Problems Associated with the Development of Geothermal Energy Systems  
[PB-261349/5] 14 p0252 N77-21725

## NICKEL CADMIUM BATTERIES

- Small space station electrical power system design concepts  
13 p0040 A77-12835
- Rechargeable batteries in Japan --- Book  
16 p0431 A77-46783
- Review of electrochemical impregnation for nickel cadmium cells --- aerospace applications  
[NASA-CR-155155] 16 p0552 N77-33601

## NICKEL COATINGS

- Improved black nickel coatings for flat plate solar collectors  
14 p0204 A77-29585
- Ellipsometry in the study of selective radiation-absorbing surfaces --- for solar energy  
16 p0406 A77-41581
- Solar absorption characteristics of several coatings and surface finishes --- for solar energy collectors  
[NASA-TM-X-3509] 14 p0229 N77-20567

## NICKEL HYDROGEN BATTERIES

- Oxygen accumulation and electrolyte loss in nickel hydrogen cells  
14 p0195 A77-28157
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries  
15 p0278 A77-33363

## NICKEL ZINC BATTERIES

- Advances in component technology for nickel-zinc cells  
13 p0025 A77-12710
- The nickel-zinc battery - A viable alternative for vehicle powering  
14 p0160 A77-22894
- Near-term advanced electric vehicle batteries  
14 p0161 A77-22909

Development of large size nickel-zinc cells for electric vehicles  
14 p0161 A77-22911

Development of nickel-zinc batteries for aircraft  
14 p0195 A77-28148

New separators for nickel-zinc batteries  
[NASA-TM-X-3465] 13 p0121 N77-14585

Fabrication and testing of large size nickel-zinc cells  
[NASA-CR-135200] 16 p0529 N77-30610

Design and cost study of a zinc/nickel oxide battery for electric vehicle propulsion  
[ANL-K-76-3543-1] 16 p0556 N77-33635

## NIOBIUM ALLOYS

Power transmission project  
[BNL-22202] 16 p0551 N77-33426

## NIOBIUM STABILITIES

Comparative cost study of the processes for producing niobium-tin (Nb<sub>3</sub>Sn) superconducting tapes for their application to power transmission lines  
[ERDA-76-160] 15 p0387 N77-26999

Design of multifilamentary Nb<sub>3</sub>Sn superconductor tailored to the requirements of a dc superconducting power transmission line  
[LA-UR-77-99] 15 p0389 N77-27311

## NITROGEN

The formation of nitrogen oxides from fuel nitrogen  
[PB-252462/7] 13 p0092 N77-10717

## NITROGEN COMPOUNDS

Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer  
15 p0290 A77-34895

Conversion and storage of wind energy as nitrogenous fertilizer  
16 p0450 A77-48762

Effect of nitrogenous bases on the thermal stability of jet fuels  
[NASA-TM-75131] 15 p0388 N77-27243

## NITROGEN DIOXIDE

Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub>  
13 p0013 A77-11568

Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide  
13 p0058 A77-16213

## NITROGEN OXIDES

Performance and NO<sub>x</sub> emissions modeling of a jet ignition prechamber stratified charge engine  
[SAE PAPER 760161] 13 p0016 A77-12150

Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer  
13 p0064 A77-17541

Water induction in hydrogen-powered IC engines  
14 p0171 A77-23721

Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products  
15 p0269 A77-32506

Formation of sulfuric anhydride and nitrogen oxides in boilers at variable operating modes  
15 p0272 A77-33174

Chemical reduction of SO<sub>3</sub>, particulates and NO<sub>x</sub> emissions  
15 p0294 A77-35188

Symposium on Combustion /International/, 16th, Massachusetts Institute of Technology, Cambridge, Mass., August 15-20, 1976, Proceedings  
16 p0439 A77-48158

NO<sub>x</sub> from fuel nitrogen in two-stage combustion  
16 p0439 A77-48169

Environmental aspects of low Btu gas combustion --- nitrogen oxide emissions from power plants  
16 p0440 A77-48178

Burner design criteria for control of NO<sub>x</sub> from natural gas combustion. Volume 1: Data analysis and summary of conclusions  
[PB-254167/0] 13 p0091 N77-10686

The proceedings of the NO<sub>x</sub> Control Technology Seminar  
[PB-253661/3] 13 p0092 N77-10707

The formation of nitrogen oxides from fuel nitrogen  
[PB-252462/7] 13 p0092 N77-10717

Proceedings: Symposium on Flue Gas Desulfurization, volume 1  
[PB-255317/0] 13 p0110 A77-12597

- Burner design criteria for control of NOx from natural gas combustion. Volume 2: Raw data and experimental results  
[PB-256806/1] 13 p0115 N77-13549
- Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames  
[PB-259911/6] 14 p0234 N77-20639
- Technology and economics of flue gas NOx oxidation by ozone  
[PB-261917/9] 15 p0350 N77-22700
- NITROSIL CHLORIDES**
- Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process  
15 p0276 A77-33350
- Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process  
14 p0238 N77-21582
- NITROUS OXIDES**
- Production of atmospheric nitrous oxide by combustion  
13 p0061 A77-16922
- Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer  
15 p0290 A77-34895
- NOAA SATELLITES**
- Remote sensing of geothermal activities of the volcanoes Aetna, Stromboli and Vesuv by means of infra-red NOAA-VHRR-satellite data --- Italy  
13 p0104 N77-12485
- NOISE GENERATORS**
- Noise mechanism separation and design considerations for low tip-speed, axial-flow fans  
13 p0046 A77-13339
- NOISE MEASUREMENT**
- Development of cumulative noise measure for the prediction of general annoyance in an average population  
15 p0320 A77-38497
- NOISE POLLUTION**
- Emissions from compressor stations --- noise pollution  
15 p0287 A77-33545
- Development of cumulative noise measure for the prediction of general annoyance in an average population  
15 p0320 A77-38497
- NONAQUEOUS ELECTROLYTES**
- Solid polymer electrolyte (SPE) fuel cell technology program, phase 1/1A --- design and fabrication  
[NASA-CR-151506] 16 p0553 N77-33605
- Solid polymer electrolyte (SPE) fuel cell technology program, phase 2/2A --- testing and evaluations  
[NASA-CR-151507] 16 p0553 N77-33606
- NONDESTRUCTIVE TESTS**
- Development of nondestructive evaluation methods for coal-conversion systems  
[CONF-760472-2] 14 p0216 N77-18567
- NONEQUILIBRIUM IONIZATION**
- Design of closed-cycle MHD generator with nonequilibrium ionization and system  
15 p0303 A77-36381
- Non equilibrium ionization in a linear magnetohydrodynamic generator, using a high pressure supersonic argon flow  
15 p0309 A77-36817
- NONEQUILIBRIUM PLASMAS**
- Non-equilibrium MHD power generation using non-seeded argon plasma  
13 p0004 A77-11022
- Construction of two-dimensional steady-state solution of equations of a nonequilibrium magnetized plasma  
13 p0065 A77-18130
- Two-dimensional analysis of end effects in diagonal type nonequilibrium plasma MHD generator  
15 p0297 A77-36097
- Ionization instability in non-equilibrium MHD generators  
16 p0416 A77-42894
- On the construction of plane stationary solutions of equations for nonequilibrium magnetized plasma  
16 p0420 A77-43705
- NONLINEAR PROGRAMMING**
- An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant  
15 p0318 A77-38207
- NONUNIFORM FLOW**
- Influence of flow nonuniformity on plasma instability at the channel wall  
15 p0269 A77-32520
- NONUNIFORM PLASMAS**
- Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators  
15 p0329 A77-39555
- NORTH AMERICA**
- North American freight transportation - Near or incipient chaos  
16 p0410 A77-41943
- Perpetually renewable biomass prospects - A comparison of U.S. and Canadian ecosystem carrying capacities vs needs  
16 p0489 A77-49084
- A parametric study of critical fuel costs for solar heating in North America  
16 p0493 A77-49118
- Crude oil supply alternatives for the Northern Tier states  
[PB-255991/2] 13 p0107 N77-12530
- NORTH CAROLINA**
- Evaluation and targeting of geothermal energy resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642
- An economic and performance design study of solar preheaters for domestic hot water heaters in North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- NORTH SEA**
- The supply of the Federal Republic of Germany and Western Europe with energy, giving particular consideration to the oil and gas potential of the North Sea  
15 p0334 A77-39673
- Antenna design for offshore satellite links  
16 p0442 A77-48493
- NORTHERN HEMISPHERE**
- Power resource estimate of ocean surface waves  
13 p0071 A77-18790
- NOZZLE DESIGN**
- Experimental study of accelerating MHD-generator jets with supersonic flow distortion  
15 p0269 A77-32519
- NOZZLE FLOW**
- The influence of the Reynolds number on the profiles of velocity and concentration in free jets of different density  
13 p0069 A77-18500
- NUCLEAR AUXILIARY POWER UNITS**
- Radioisotope power sources in the terrestrial and marine environment  
14 p0196 A77-28170
- NUCLEAR DEVICES**
- Approaches to extracting potentially recoverable hydrocarbons --- nuclear explosive mining of natural gas and crude oil  
15 p0322 A77-38786
- NUCLEAR ELECTRIC POWER GENERATION**
- PACER - A practical fusion power concept  
13 p0035 A77-12793
- The nuclear spinner for Satcom applications --- comparing nuclear and solar power supplies  
13 p0041 A77-12838
- Does solar energy demand more land surface, and more materials or energy investment than nuclear energy or fossil fuels - A preliminary study  
14 p0155 A77-21857
- The principles of system studies in nuclear energy research  
14 p0157 A77-22342
- Economics of alternative energy sources  
15 p0288 A77-33755
- Energy supply of the Federal Republic of Germany  
16 p0419 A77-43566
- A comparison of the economics of nuclear and solar power  
16 p0485 A77-49049
- Nuclear-powered Hysat spacecraft: Comparative design study  
[ERDA-SHS-3063-8] 13 p0094 A77-11108
- Costs of alternative sources of electricity  
[PB-255765/0] 13 p0107 N77-12528



# SUBJECT INDEX

# NUCLEAR FUSION

Nuclear unit productivity analysis  
 [PB-257553/8] 13 p0132 N77-15528  
 Chemical engineering side of nuclear fusion power  
 [PPPL-1303] 15 p0376 N77-25965  
 Energy technologies for the West: Fission as an  
 option  
 [TID-27432] 16 p0538 N77-31647  
 Regional economic impacts of nuclear power plants  
 [BNL-50562] 16 p0540 N77-31676  
 Environmental cost/benefit analysis for fusion  
 power plants  
 [BNWL-2028] 16 p0549 N77-32893  
 Public acceptance of nuclear power  
 [IAEA-CN-36/507] 16 p0555 N77-33630  
 Role of nuclear power in meeting future U.S.  
 energy needs  
 [IAEA-CN-36/396] 16 p0560 N77-33677  
 Technical and economic studies of small reactors  
 for supply of electricity and steam  
 [IAEA-CN-36/398] 16 p0560 N77-33678  
 Nuclear power aspects in an oil and coal producing  
 country  
 [IAEA-CN-36/175] 16 p0560 N77-33681  
 Survey of nuclear fuel cycle economics: 1970 - 1985  
 [ORNL-TM-5703] 16 p0561 N77-33968  
**NUCLEAR ELECTRIC PROPULSION**  
 ERDA's Bicentennial Thermionic Research and  
 Technology Program 13 p0042 A77-12861  
**NUCLEAR ENERGY**  
 Fusion power --- nuclear energy technology  
 development 13 p0005 A77-11034  
 Problems involved in improving the industrial fuel  
 and energy balance 13 p0012 A77-11347  
 Nuclear power - Compared to what --- energy  
 alternatives for electric power generation  
 13 p0017 A77-12234  
 Is nuclear energy economically viable ---  
 competition with coal 13 p0045 A77-12933  
 Air, water, nuclear power make gasoline 13 p0045 A77-12935  
 Environment and energy production after the year  
 2000 13 p0056 A77-16203  
 Economics of nuclear-electrolytic hydrogen  
 15 p0285 A77-33419  
 Statistical utility theory for comparison of  
 nuclear versus fossil power plant alternatives  
 15 p0291 A77-35015  
 Comparative energy policies of France, England,  
 and Germany. II - Electricity and nuclear energy  
 15 p0324 A77-39505  
 The significance of nuclear energy for satisfying  
 future energy requirements 15 p0333 A77-39649  
 Energy resources available to man 16 p0402 A77-41422  
 Some impacts of restricting nuclear energy  
 availability 16 p0415 A77-42857  
 Generalized criterion for controlled fusion  
 16 p0436 A77-47368  
 Synthetic carbonaceous fuels and feedstocks from  
 oxides of carbon and nuclear power 16 p0444 A77-48711  
 Critical materials problems in energy production  
 --- Book 16 p0509 A77-51627  
 Hydrogen production process by means of nuclear  
 energy 14 p0237 N77-21553  
 Competitively priced hydrogen via high-efficiency  
 nuclear electrolysis 14 p0237 N77-21558  
 Hydrogen production from coal using a nuclear heat  
 source 14 p0238 N77-21568  
 Energy storage possibilities of atomic hydrogen  
 14 p0245 N77-21643  
 Economics of nuclear - electrolytic hydrogen  
 14 p0247 N77-21659  
 Report of the National Research Council Committee  
 on Nuclear and Alternative Energy Systems  
 [PB-263595/1] 15 p0367 N77-24633

**NUCLEAR FISSION**  
 Energy technologies for the West: Fission as an  
 option  
 [TID-27432] 16 p0538 N77-31647  
**NUCLEAR FUELS**  
 The reprocessing of nuclear fuels 13 p0055 A77-15807  
 Concept of a fusion burner 13 p0061 A77-17014  
 Advanced fuels for inertial confinement --- in  
 laser fusion 13 p0061 A77-17016  
 Combined utilization of nuclear and organic fuels  
 15 p0272 A77-33159  
 Comparative breeding characteristics of fusion and  
 fast reactors 15 p0297 A77-36124  
 Design considerations for a mixed advanced fuel  
 fusion reactor 15 p0334 A77-39747  
 Symposium on Clean Fusion, 1st, Washington, D.C.,  
 April 30, 1976, Proceedings 16 p0435 A77-47355  
 Studies of deuterium-fueled Tokamak reactors  
 16 p0435 A77-47357  
 Advanced fuel nuclear reaction feasibility using  
 laser compression. I 16 p0435 A77-47358  
 Advanced fuel nuclear reaction feasibility using  
 laser compression. II 16 p0435 A77-47359  
 Impact of advanced fuel fusion on electric power  
 transmission 16 p0436 A77-47361  
 Advanced fuel fusion experimentation with  
 wigwag cells II and III - Orbit diagnostics and  
 lifetime measurements 16 p0436 A77-47362  
 Conditions for a boron fusion reactor in the MeV  
 range 16 p0436 A77-47366  
 Advanced fuel fusion application to manned space  
 propulsion 16 p0436 A77-47367  
 Unified criterion for proximity to controlled fusion  
 16 p0436 A77-47369  
 An assessment of the materials needs for a Kr-85  
 fuel capsule 16 p0462 A77-48855  
 Gaseous fuel reactors for power systems 16 p0468 A77-48906  
 Environmental survey of the reprocessing and waste  
 management portions of the LWR fuel cycle: A  
 task force report  
 [PB-258316/9] 14 p0209 N77-16879  
 ENFORM: An energy information system  
 [BNWL-2195] 16 p0542 N77-32016  
 Role of nuclear power in meeting future U.S.  
 energy needs  
 [IAEA-CN-36/396] 16 p0560 N77-33677  
 Survey of nuclear fuel cycle economics: 1970 - 1985  
 [ORNL-TM-5703] 16 p0561 N77-33968  
**NUCLEAR FUSION**  
 PACER - A practical fusion power concept  
 13 p0035 A77-12793  
 Heat transfer problems associated with laser fusion  
 13 p0068 A77-18441  
 Status and outlook of controlled nuclear fusion  
 14 p0163 A77-23095  
 Nuclear fusion - Focus on Tokamak 16 p0407 A77-41645  
 Energy and technology review  
 [UCID-52000-76-2] 13 p0131 N77-15508  
 Assessment of the role of magnetic mirror devices  
 in fusion power development 14 p0213 N77-17872  
 Assessment of laser-driven fusion  
 [PB-260691/1] 14 p0234 N77-20880  
 Chemical engineering side of nuclear fusion power  
 [PPPL-1303] 15 p0376 N77-25965  
 Evaluation of the technical and economic  
 feasibility of mirror fusion devices  
 [UCRL-13695] 15 p0386 N77-26977  
 Fusion. The future energy source 15 p0397 N77-27951  
 Current fusion power plant design concepts  
 [BNWL-2013] 16 p0549 N77-32894  
 Role of fusion as a future power source  
 [IAEA-CN-36/428] 16 p0549 N77-32895

- JET project (design proposal) --- Tokamak experiment  
[EUR-5516] 16 p0549 N77-32914
- Projected thermodynamic efficiencies of fusion  
power plants 16 p0550 N77-32958
- Sandia Laboratories energy programs  
[SAND-77-0034] 16 p0555 N77-33629
- NUCLEAR HEAT**
- Hydrogen production using nuclear heat  
13 p0057 A77-16211
- A method for increasing the efficiency of the  
electric generating process 14 p0183 A77-26087
- Hydroretorting of oil shale with nuclear process  
heat 14 p0185 A77-26432
- [ASME PAPER 76-WA/ENER-3]
- Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process 15 p0276 A77-33350
- Hydrogen production by water decomposition using a  
combined electrolytic-thermochemical cycle 15 p0277 A77-33356
- Trends in western Europe --- lignite gasification  
cost effectiveness 15 p0308 A77-36808
- A technical scale gas generator for steam  
gasification of coal using nuclear heat 16 p0502 A77-50255
- NUCLEAR POWER PLANTS**
- Methods of energy analysis 13 p0007 A77-11046
- The mysteries of nuclear programs --- energy  
conversion efficiency 13 p0011 A77-11337
- Nuclear power, coal and energy conservation /with  
a note on the costs of a nuclear moratorium/  
13 p0013 A77-11524
- The reprocessing of nuclear fuels 13 p0055 A77-15807
- Relative hazard of nuclear power stations and  
fossil-fuel power stations to the environment 13 p0067 A77-18323
- Principles of atomic central heating 14 p0136 A77-20102
- The helium turbine - A power station of the future  
14 p0138 A77-20951
- A method for increasing the efficiency of the  
electric generating process 14 p0183 A77-26087
- Description, output and development prospects of a  
750 C helium direct cycle nuclear power plant  
with a single turbomachine and intermediate  
cooling 14 p0197 A77-28522
- [ASME PAPER 77-GT-2]
- Combined production of electrical power and  
desalinated water by nuclear power plants 15 p0255 A77-30100
- Energy investment in nuclear and solar power plants  
15 p0257 A77-30599
- Analysis of electrical power generation costs  
15 p0257 A77-30600
- Role of the nuclear energy system in the total  
fuel-energy picture in the USSR 15 p0267 A77-32220
- Energy in competition --- coal and nuclear energy  
15 p0271 A77-32799
- Hydrogen production process by means of nuclear  
energy 15 p0273 A77-33327
- Hydrogen production from nuclear waste energy  
15 p0274 A77-33331
- Peak power and heavy water production from  
electrolytic H<sub>2</sub> and O<sub>2</sub> using CANDU reactors  
15 p0274 A77-33332
- Synthetic carbonaceous fuel and feedstock using  
nuclear power, air and water 15 p0321 A77-38532
- Management analysis of nuclear allocation for the  
generation of electricity 16 p0413 A77-42590
- Molten salt thermal energy storage for utility  
peaking loads 16 p0451 A77-48765
- Compressed air storage for load leveling of  
nuclear power plants 16 p0459 A77-48826
- Combined heat and electricity generation as a  
means for saving primary energy 16 p0505 A77-51155
- Development of new technologies for energy  
production in the Federal Republic of Germany  
16 p0505 A77-51157
- A new cycle for optimum energy storage in  
interplanetary missions 16 p0507 A77-51444
- [IAF PAPER 77-141]
- Methods in environmental sampling for radionuclides  
[UCRL-77722] 13 p0091 N77-10697
- Characteristics of a first generation commercial  
fusion power plant 13 p0093 N77-10891
- [GA-A-13661]
- Net energy from nuclear power 13 p0107 N77-12527
- [PB-254059/9]
- Effect of mechanical cooling devices on ambient  
salt concentration 13 p0125 N77-14631
- [PB-256679/2]
- Feasibility study of a nuclear power-sewage  
treatment system for the conservation and  
reclamation of water resources 13 p0126 N77-14960
- [PB-255630/6]
- Dual purpose nuclear power plants for military  
installations 13 p0132 N77-15521
- [AD-A026141]
- Electric power development in the Pacific  
Northwest Region: Institutional commitments and  
alternatives, phase 1 15 p0348 N77-22671
- [PB-262382/5]
- Atmospheric impacts of evaporative cooling systems  
[ANL-ES-53] 15 p0367 N77-24643
- Gas turbine HTGR program 15 p0393 N77-27539
- [GA-A-14097]
- Tokamak experimental power reactor  
[CONP-761107-23] 15 p0397 N77-27946
- Heat transportation by hot water pipe-lines at 90  
deg C 16 p0512 N77-28453
- [AD-A038301]
- A parametric utility comparison of coal and  
nuclear electricity generation 16 p0523 N77-29634
- [PB-266064/5]
- Current fusion power plant design concepts  
[BNWL-2013] 16 p0549 N77-32894
- Public acceptance of nuclear power  
[IAEA-CN-36/507] 16 p0555 N77-33630
- NUCLEAR POWER REACTORS**
- Studies and thoughts on nuclear reactor systems  
13 p0055 A77-15800
- Research and development for Canadian nuclear power  
[AECL-5314] 13 p0097 N77-11533
- Gas cooled reactor assessment, volume 1  
[TID-27424-VOL-1] 16 p0541 N77-31945
- Subsea nuclear power generating stations for  
offshore oil production operations. Preliminary  
safety and licensing information document  
[AT-ERDA-13193] 16 p0556 N77-33637
- NUCLEAR PROPULSION**
- Future space experiments with levitated capacitor  
for thermonuclear microexplosions 16 p0508 A77-51575
- [IAF PAPER 77-ST-11]
- An evaluation of very large airplanes and  
alternative fuels: Executive summary  
[AD-A042112] 16 p0550 N77-33154
- NUCLEAR PUMPING**
- Power deposition in He from the volumetric  
He-3/n,p/H-3 reaction --- for direct nuclear  
pumped lasers 16 p0426 A77-45307
- NUCLEAR REACTIONS**
- Power deposition in He from the volumetric  
He-3/n,p/H-3 reaction --- for direct nuclear  
pumped lasers 16 p0426 A77-45307
- NUCLEAR REACTORS**
- Nuclear power for the production of synthetic  
fuels and feedstocks 13 p0035 A77-12790
- Nuclear driven water decomposition plant for  
hydrogen production 13 p0035 A77-12791
- Alkali metal space power technology applicable to  
national energy research and development  
[ATIA PAPER 77-289] 13 p0065 A77-18223
- Combined utilization of nuclear and organic fuels  
15 p0272 A77-33159
- Will the large-scale production of hydrogen be  
part of the energy problem or part of its solution  
15 p0284 A77-33415

# SUBJECT INDEX

# OCEAN THERMAL ENERGY CONVERSION

Gaseous fuel reactors for power systems  
16 p0468 A77-48906

Will the large-scale production of hydrogen be  
part of the energy problem or part of its solution  
[UCRL-76444] 13 p0687 N77-10652

The contribution of nuclear technology toward the  
solution of energy problems  
[INIS-MF-1867] 13 p0100 N77-11565

Heat pipes with a non-condensable gas and their  
application in nuclear apparatus and instruments  
13 p0120 N77-14387

Energy storage and transfer with homopolar machine  
for a linear theta-pinch hybrid reactor  
[LA-6174] 14 p0214 N77-17892

Hydrogen production by water decomposition using a  
combined electrolytic thermochemical cycle  
14 p0238 N77-21589

An examination of the stirred reactor as a tool  
for the determination of rate constants of the  
H2-O2 combustion reactions  
14 p0245 N77-21644

Will the large-scale production of hydrogen be  
part of the energy problem or part of its  
solution?  
14 p0246 N77-21654

Internalizing social costs in power plant siting:  
Some examples for coal and nuclear plants in the  
United States  
[CONF-761103-16] 15 p0386 N77-26816

Some thoughts on optimizing long-distance heat  
transport systems and their storage facilities  
[AD-A038253] 16 p0516 N77-28608

National Research Council Committee on Nuclear and  
Alternative Energy Systems  
[TID-27435] 16 p0538 N77-31655

**NUCLEAR RESEARCH**  
World survey of major facilities in controlled  
fusion research --- Eck  
13 p0067 A77-18264

Electron beam research at Sandia Laboratories, USA  
--- for inertial confinement fusion  
14 p0138 A77-20706

The national laser-fusion program  
14 p0168 A77-23502

Prospects for fusion energy  
14 p0178 A77-24928

The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich  
15 p0273 A77-33328

Adapting the experience of DOD/Industry to  
developing fusion power reactors  
[AIAA 77-1019] 16 p0404 A77-41561

Symposium on Engineering Problems of Fusion  
Research, 6th, San Diego, Calif., November  
18-21, 1975, Proceedings  
16 p0425 A77-44975

**NUCLEAR RESEARCH AND TEST REACTORS**  
Review of the state of the art with Tokamaks in USSR  
[EJR-CEA-FC-839-TR] 16 p0541 N77-31981

**NUCLEONICS**  
The NASA thermionic-conversion /TEC-ART/ program  
16 p0438 A77-47960

**NUMERICAL ANALYSIS**  
Numerical solutions for steady free convection in  
island geothermal reservoirs  
14 p0174 A77-24205

Reduction of the transverse edge effect in linear  
machines with homogeneous secondary armature by  
changing the air gap configuration  
15 p0310 A77-36939

Wind power studies: Field measurement priorities  
for numerical analysis of wind energy  
[UCRL-50034-76-3] 14 p0249 N77-21681

Wind power studies: Regional wind energy  
measurements  
[UCRL-50034-76-4] 15 p0392 N77-27527

Large scale scientific computation via minicomputer  
[PB-267575/9] 16 p0541 N77-31823

Numerical simulation of United States Gulf Coast  
geothermal geopressured reservoirs  
16 p0545 N77-32585

**NUMERICAL CONTROL**  
Transport systems guarantee efficient utilization  
of energy resources  
13 p0053 A77-15048

## NUMERICAL WEATHER FORECASTING

The influence of subsurface energy storage on  
seasonal temperature variations  
13 p0067 A77-18351

## 0

## OASES

Energy in an oasis: Geothermal resource  
development in the Imperial Valley of California  
16 p0552 N77-33598

## OCEAN BOTTOM

Submarine geothermal resources  
13 p0010 A77-11322

## OCEAN CURRENTS

Energy from the oceans - Requirements and  
capabilities  
15 p0272 A77-33141

## OCEAN SURFACE

Power resource estimate of ocean surface waves  
13 p0071 A77-18790

Hydrodynamic basis of wave-energy converters of  
channel form  
15 p0267 A77-32211

Use of Landsat data for the detection of marine  
oil slicks --- for oil exploration and pollution  
control  
15 p0267 A77-32244

Wave power --- potentially available in New Zealand  
16 p0418 A77-43011

Ocean wave power  
16 p0499 A77-49349

## OCEAN THERMAL ENERGY CONVERSION

The atmosphere and the oceans as energy sources  
13 p0005 A77-11036

Power production from high temperature geothermal  
waters  
13 p0030 A77-12751

The utilization and economics of low temperature  
geothermal water for space heating  
13 p0030 A77-12756

Energy transmission from ocean thermal energy  
conversion plants  
13 p0032 A77-12773

OTEC - Aerospace and ocean engineering in  
partnership --- Ocean Thermal Energy Conversion  
[AIAA PAPER 77-296] 13 p0066 A77-18227

Thermal energy of oceans  
14 p0153 A77-21833

Electricity from the thermal power of the sea  
14 p0176 A77-24218

Heat exchangers for the Ocean Thermal Energy Power  
Plant  
14 p0176 A77-24219

Solar power from the oceans --- ocean thermal  
energy conversion  
14 p0190 A77-26724

Energy from the oceans - Requirements and  
capabilities  
15 p0272 A77-33141

Design of an ocean thermal energy plant ship to  
produce ammonia via hydrogen  
15 p0274 A77-33335

Ocean thermal energy delivery systems based on  
chemical energy carriers  
15 p0279 A77-33375

The OTEC answer to OPEC - Solar sea power  
15 p0303 A77-36409

Sea water - The energy elixir --- ocean thermal,  
tide and wave energy conversion  
15 p0320 A77-38446

Perspectives on implementing OTEC power --- Ocean  
Thermal Energy Conversion  
[AIAA 77-1024] 16 p0404 A77-41564

The oceans as a source of electricity  
16 p0412 A77-42401

Technical and economic feasibility of Ocean  
Thermal Energy Conversion  
16 p0481 A77-49018

Economic aspects of Ocean Thermal Energy Conversion  
16 p0484 A77-49041

Preliminary research on Ocean Energy Industrial  
Complexes  
16 p0484 A77-49042

Studies of biofouling in ocean thermal energy  
conversion plants  
16 p0484 A77-49044

- Design of low-cost aluminum heat exchangers for OTEC plant-ships --- Ocean Thermal Energy Conversion  
16 p0485 A77-49046
- Sensitivity analysis for OTEC propane and mixture cycles --- Ocean Thermal Energy Conversion  
16 p0485 A77-49047
- Gulf Stream OTEC resource potential and environmental impact assessment overview --- Ocean Thermal Energy Conversion  
16 p0485 A77-49048
- A comparison of the economics of nuclear and solar power  
16 p0485 A77-49049
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report  
[PB-257444/0] 13 p0116 N77-13554
- Ocean thermal energy delivery systems based on chemical energy carriers  
14 p0240 N77-21609
- An optimization study of a low thermal potential power system  
[AD-A034709] 15 p0348 N77-22666
- Internal heat transfer experiments in a simulated OTEC evaporator tube  
[APL/JHU/AEO-76-066] 16 p0521 N77-29611
- Ocean Thermal Energy Conversion (OTEC)  
16 p0526 N77-30278
- Geophysical fluid dynamics background for ocean thermal power plants  
[DSE/1005-1] 16 p0555 N77-33624
- Marine pastures: A by-product of large (100 megawatt or larger) floating ocean-thermal power plants  
[COO-2581-3] 16 p0555 N77-33625
- OCEANOGRAPHY**
- OTEC - Aerospace and ocean engineering in partnership --- Ocean Thermal Energy Conversion  
[AIAA PAPER 77-296] 13 p0066 A77-18227
- Proceedings of a workshop on environmental oceanography of the Gulf of Mexico  
[ORO-5017-1] 15 p0386 N77-26787
- OCEANS**
- Economic evaluation of mixture and pure fluid cycles in ocean thermal energy conversion systems  
[ORO-4918-8] 14 p0217 N77-18578
- Ocean thermal energy conversion opportunities  
[BNWL-SA-5808] 14 p0217 N77-18581
- Design of an ocean thermal energy plant ship to produce ammonia via hydrogen  
14 p0237 N77-21564
- Preliminary research on ocean energy industrial complexes, phase 1  
[ORO-4915-3] 14 p0248 N77-21669
- OFFSHORE ENERGY SOURCES**
- Off-shore oil scenarios - Method and results  
13 p0018 A77-12282
- Production of methane using offshore wind energy  
13 p0026 A77-12722
- Prerequisites for military/civilian geopressed geothermal resource development  
13 p0031 A77-12761
- Satellite communications for off-shore oil operations using WESTAR  
13 p0053 A77-15130
- Windmills change direction --- British system utilizing offshore windmills and depleted North Sea fields  
13 p0060 A77-16620
- Ocean thermal energy delivery systems based on chemical energy carriers  
15 p0279 A77-33375
- Hydrogen in the seaward advancement of industrial societies --- offshore energy production  
15 p0285 A77-33417
- Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis  
15 p0298 A77-36254
- Sea water - The energy elixir --- ocean thermal, tide and wave energy conversion  
15 p0320 A77-38446
- Hydrocarbon deposits beyond the shelf edge of the oceans  
16 p0400 A77-40682
- The oceans as a source of electricity  
16 p0412 A77-42401
- Wave power --- potentially available in New Zealand  
16 p0418 A77-43011
- Helicopter offshore operations --- oil and gas exploration and production  
16 p0421 A77-44437
- Some legal-institutional implications of offshore wind energy conversion systems  
16 p0489 A77-49086
- Identification and analysis of mid-Atlantic onshore OCS impact  
[PB-254925/1] 13 p0096 N77-11516
- Proceedings of a Symposium on Offshore Oil Potential and Related Land Use Impacts in the Central California Coastal Zone  
[PB-259074/3] 14 p0215 N77-18547
- Drilling for energy resources  
[PB-259206/1] 14 p0235 N77-20972
- Subsea nuclear power generating stations for offshore oil production operations. Preliminary safety and licensing information document  
[AI-ERDA-13193] 16 p0556 N77-33637
- OFFSHORE PLATFORMS**
- Antenna design for offshore satellite links  
16 p0442 A77-48493
- Research and development assessment on safety and pollution control for outer continental shelf operations  
[AD-A034727] 15 p0357 N77-23635
- OFFSHORE REACTOR SITES**
- Subsea nuclear power generating stations for offshore oil production operations. Preliminary safety and licensing information document  
[AI-ERDA-13193] 16 p0556 N77-33637
- OHIO**
- Development of a multi-disciplinary ERTS user program in the state of Ohio  
[E77-10045] 13 p0104 N77-12475
- Strategic petroleum reserve. Draft environmental impact statement for Ironton Mine  
[PB-262451/8] 15 p0362 N77-24573
- OHMIC DISSIPATION**
- A simplified technique for determining the boundary layer voltage loss in MHD generators  
16 p0416 A77-42897
- Degradation of solar cell efficiency by sheet resistance  
16 p0438 A77-47854
- Pulsed energy and switching requirements for Tokamak ohmic heating  
[LA-UR-76-2473] 15 p0397 N77-27932
- Power loss problems in EXTRAP coil systems  
[TRITA-PFU-77-02] 16 p0549 N77-32910
- OHMS LAW**
- Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators  
15 p0329 A77-39555
- OIL EXPLORATION**
- Energy and the oil industry  
13 p0005 A77-11031
- A word on worldwide petroleum resources  
13 p0011 A77-11336
- Concerning world oil resources. II - Statistical logistic models /King Hubbert's models/  
13 p0011 A77-11339
- World petroleum resources. IV - Probabilistic methods  
13 p0012 A77-11343
- The world's oil resources. V - Recovery rates  
13 p0012 A77-11343
- Oil shale development  
13 p0023 A77-12693
- Satellite communications for off-shore oil operations using WESTAR  
13 p0053 A77-15130
- Use of Landsat data for the detection of marine oil slicks --- for oil exploration and pollution control  
15 p0267 A77-32244
- Hydrocarbon deposits beyond the shelf edge of the oceans  
16 p0400 A77-40682
- Pyrolysis kinetics for oil-shale particles  
16 p0401 A77-41316
- Helicopter offshore operations --- oil and gas exploration and production  
16 p0421 A77-44437

- The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 --- Bolivia  
[E77-10028] 13 p0096 N77-11491
- The exploration, development and production of Naval petroleum reserve number 4  
[PB-256714/7] 13 p0113 N77-13516
- The exploration, development, and production of Naval Petroleum Reserve Number 4  
[PB-255547/4] 13 p0124 N77-14610
- Evaluation of combined in-situ and surface retorting of oil shale tract C-b  
[PB-261064/0] 15 p0347 N77-22646
- Applications of aerospace technology to petroleum exploration. Volume 1: Efforts and results  
[NASA-CR-152694] 15 N77-22741
- Applications of aerospace technology to petroleum exploration. Volume 2: Appendices  
[NASA-CR-152693] 15 p0351 N77-22742
- OIL FIELDS**
- World oil resources. III - The geological analogy method  
13 p0012 A77-11341
- Approaches to extracting potentially recoverable hydrocarbons --- nuclear explosive mining of natural gas and crude oil  
15 p0322 A77-38786
- Interfacial effects in the recovery of residual oil by displacement: Studies at Northwestern University  
[COO-0019-5] 13 p0122 N77-14595
- The exploration, development, and production of Naval Petroleum Reserve Number 4  
[PB-255947/4] 13 p0124 N77-14610
- OIL POLLUTION**
- Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source  
16 p0425 A77-44675
- Being prepared for future Argo Merchants --- tanker oil spill prevention  
16 p0425 A77-45228
- Tests of oil recovery devices in broken ice fields, phase 2  
[AD-A025748] 13 p0110 N77-12572
- Temperature effects of crude oil in the upper intertidal zone  
[PB-255956/5] 13 p0110 N77-12581
- The biodegradation of oil in sea water for naval pollution control  
[AD-A042375] 16 p0560 N77-33688
- OIL RECOVERY**
- The world's oil resources. V - Recovery rates  
13 p0012 A77-11343
- In situ recovery of oil and minerals from Piceance Creek Basin oil shale  
13 p0023 A77-12694
- In situ combustion of Michigan oil shale - Current field studies  
13 p0024 A77-12695
- Retorting of single oil shale blocks with nitrogen and air  
13 p0024 A77-12696
- Sulfur compounds in oils from the Western Canada Tar Belt  
14 p0169 A77-23553
- Production of synthetic crude from crude shale oil produced by in situ combustion retorting  
14 p0169 A77-23557
- Solution of silica in Green River oil shale  
14 p0169 A77-23558
- Fracturing oil shale with explosives for in situ recovery  
14 p0169 A77-23559
- Characterization of a Utah tar sand bitumen  
14 p0170 A77-23561
- Feasibility studies of a biochemical desulfurization method --- using microorganisms as agent from high sulfur containing petroleum  
14 p0170 A77-23562
- Fracturing oil shale for in situ retorting experiments  
14 p0193 A77-27341
- Development of the modified in situ oil-shale process  
14 p0193 A77-27342
- Combustion of oil-shale carbon residue  
14 p0193 A77-27343
- In-place recovery of multiple products from Colorado's saline-mineral-bearing Piceance Basin  
14 p0193 A77-27344
- The Asphalt Ridge tar-sand deposits  
14 p0193 A77-27347
- Field experiment of in-situ oil recovery from a Utah tar sand by reverse combustion  
14 p0193 A77-27348
- Recovery of bitumen from oil-impregnated sandstone deposits of Utah  
14 p0194 A77-27349
- Mathematical modeling of in situ oil shale retorting  
14 p0196 A77-28474
- Gas-solid heat transfer coefficients in beds of crushed oil shale  
14 p0196 A77-28472
- Kinetics of heterogeneously catalyzed coal hydroliquefaction  
14 p0196 A77-28473
- Tertiary oil production process  
14 p0196 A77-28520
- The Garrett oil-from-waste process and resource recovery system  
15 p0293 A77-35162
- The potential and economics of enhanced oil recovery  
[PB-254991/3] 13 p0086 N77-10633
- Tests of oil recovery devices in broken ice fields, phase 2  
[AD-A025748] 13 p0110 N77-12572
- Interfacial effects in the recovery of residual oil by displacement: Studies at Northwestern University  
[COO-0019-5] 13 p0122 N77-14595
- Pyrolysis of oil shale: The effects of thermal history on oil yield  
[UCRL-77831] 13 p0129 N77-15499
- In-situ laser retorting of oil shale  
[NASA-CASE-LEW-12217-1] 14 p0214 N77-18429
- Oil and fat absorbing polymers  
[NASA-CASE-NPO-11609-2] 16 p0532 N77-31308
- Management plan for enhanced oil recovery. Volume 1: Program strategy  
[ERDA-77-15/1-VOL-1] 16 p0536 N77-31629
- Research and development in enhanced oil recovery. Part 1: Overview  
[ERDA-77-20/1] 16 p0537 N77-31637
- National benefits/costs of enhanced oil recovery research  
[FE-2021-4] 16 p0538 N77-31649
- Research and development in enhanced oil recovery. Part 2: The program  
[ERDA-77-20/2] 16 p0538 N77-31650
- Research and development in enhanced oil recovery. Part 3: The methodology  
[ERDA-77-20/3] 16 p0538 N77-31651
- Thermodynamic analysis of an oil reclamation process  
[PB-268524/6] 16 p0548 N77-32614
- OIL SLICKS**
- Use of Landsat data for the detection of marine oil slicks --- for oil exploration and pollution control  
15 p0267 A77-32244
- Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea  
16 p0433 A77-47080
- Tests of oil recovery devices in broken ice fields, phase 2  
[AD-A025748] 13 p0110 N77-12572
- OILS**
- Storage in oil of off-peak thermal energy from large power stations  
13 p0027 A77-12730
- Oil and fat absorbing polymers  
[NASA-CASE-NPO-11609-2] 16 p0532 N77-31308
- ONBOARD EQUIPMENT**
- Methods of on-board generation of hydrogen for vehicular use  
15 p0280 A77-33383
- Automotive fuel-saving system with on-board hydrogen generation and injection into I. C. engines  
15 p0280 A77-33384
- OPERATING TEMPERATURE**
- The analysis of the temperature regimes of the operation of a gas-regulated heat pipe  
13 p0064 A77-17924
- Solar energy for the Australian food processing industry  
14 p0181 A77-25900

# OPERATIONAL HAZARDS

# SUBJECT INDEX

Optimum solar collector operation for maximizing cycle work output  
15 p0255 A77-30313

**OPERATIONAL HAZARDS**  
Relative hazard of nuclear power stations and fossil-fuel power stations to the environment  
13 p0067 A77-18323  
Hydrogen safety problems --- fuel systems hazard prevention  
15 p0283 A77-33402

**OPERATIONAL PROBLEMS**  
Experience in putting the Kiskadee hydroelectric power plant on line  
13 p0010 A77-11301  
North American freight transportation - Near or incipient chaos  
16 p0410 A77-41943  
Studies of biofouling in ocean thermal energy conversion plants  
16 p0484 A77-49044  
Nuclear unit productivity analysis [PB-257553/8]  
13 p0132 A77-15528  
Research into the impact on electrical equipment from variable speed operation of pumped-storage plants [PB-268323/3]  
16 p0548 A77-32618

**OPERATIONS RESEARCH**  
Trade-off analyses for multi-objective transportation plans  
13 p0102 A77-11911  
Analysis of information systems for hydropower operations [NASA-CR-149373]  
13 p0129 A77-15497  
Operations research investigations of satellite power stations [NASA-TM-X-73372]  
14 p0236 A77-21547  
Energy models and large-scale systems optimization [AD-A033736]  
15 p0365 A77-24619

**OPTICAL COUPLING**  
Development of 20 percent efficient solar cell [PB-255903/7]  
13 p0108 A77-12548

**OPTICAL EQUIPMENT**  
Geometric katoptrics - Applications to solar energy  
14 p0166 A77-23383  
High-sensitivity detection procedures and devices for angular variations - Application to automatic control of a solar furnace heliostat  
14 p0166 A77-23386  
Solar collectors using total internal reflections  
14 p0204 A77-29596

**OPTICAL MEASUREMENT**  
Investigation of p-Al/x/Ga/1-x/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra  
14 p0143 A77-21311  
Evaluation of cadmium stannate films for solar heat collectors  
14 p0198 A77-29021  
The use of lasers for the inspection of heliotechnical reflectors  
15 p0286 A77-33432  
Using lasers to inspect solar-energy reflectors  
16 p0427 A77-45545  
In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures  
16 p0440 A77-48173

**OPTICAL MEASURING INSTRUMENTS**  
Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator [WSS/CI PAPER 76-53]  
16 p0508 A77-51611

**OPTICAL PROPERTIES**  
Effect of optical properties of a surface exposed to solar radiation on the radiation balance  
13 p0052 A77-14928  
Study and materialization of a selective surface designed for direct thermal conversion of solar energy - Application to medium temperature range  
13 p0069 A77-18496  
An inflatable solar concentrator for a high temperature storage system  
13 p0074 A77-19064  
Double-reflection solar energy concentrators  
13 p0074 A77-19067  
Optical and thermal properties of Compound Parabolic Concentrators  
14 p0157 A77-22641

Selective behavior and selective layer deposition in the case of light-transparent covers --- for solar collectors  
14 p0202 A77-29564

Wavelength-selective surfaces for solar energy utilization  
14 p0204 A77-29583

Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films --- of solar collectors  
16 p0502 A77-50281

Cast polycrystalline silicon Schottky-barrier solar cells  
16 p0503 A77-50295

Symposium on the Fundamental Optical Properties of Solids Relevant to Solar Energy Conversion [PB-256615/6]  
13 p0108 A77-12538

The optical properties of chromium oxide films and the high temperature stabilization of silver films for photothermal solar energy conversion  
13 p0128 A77-15484

Optical study of fixed spherical solar collectors [LAS-PRC-76-01]  
15 p0373 A77-25653

**OPTICAL PUMPING**  
Analysis of the sun pumped laser cone optics [AD-A034284]  
15 p0361 A77-24483

**OPTICAL REFLECTION**  
A novel cover slide for solar cells  
14 p0148 A77-21789  
The geometry of catoptric light. II - An application to solar energy  
16 p0417 A77-42959  
Use of calculated displaced shapes to define the reflected light pattern from a focused collector  
16 p0473 A77-48948  
Lightweight reflector assembly [NASA-CASE-WPO-13707-1]  
16 p0518 A77-28933

**OPTICAL TRACKING**  
Performance of two fixed-mirror solar concentrators for process heat  
13 p0074 A77-19065  
Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASME PAPER 76-WA/HT-10]  
14 p0186 A77-26470

**OPTICAL WAVEGUIDES**  
Characteristics of a system for transmitting concentrated solar radiation  
13 p0051 A77-14578  
Features of systems for transmission of concentrated solar radiation  
15 p0290 A77-34972

**OPTICS**  
Geometric katoptrics - Applications to solar energy  
14 p0166 A77-23383  
Optics in solar energy utilization II; Proceedings of the Seminar, San Diego, Calif., August 24, 25, 1976  
14 p0203 A77-29576

**OPTICAL CONTROL**  
Optimal control of flow in low temperature solar heat collectors  
13 p0019 A77-12409  
A new method for collector field optimization --- computerized simulation of solar tower facility  
13 p0074 A77-19070  
Influence of the intended use of an aircraft on the optimal parameters of gas-turbine power plants  
15 p0266 A77-32086  
Optimization of automotive engine fuel economy and emissions  
15 p0320 A77-38373  
An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system  
16 p0437 A77-47752  
Optimization of confinement in a toroidal plasma subject to strong radial electric fields  
16 p0438 A77-47958  
Automatic optimization of operating modes in thermionic electrical power generators [IAF PAPER 77-142]  
16 p0507 A77-51445

**OPTIMIZATION**  
Optimization of current source operation in pulse mode --- for electrochemical generators [IAF PAPER 76-255]  
13 p0003 A77-10952  
Optimization criteria for solar and wind power systems  
13 p0015 A77-11923

# SUBJECT INDEX

# ORGANIC MATERIALS

Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance 13 p0020 A77-12657

The use of program GEOTHEM to design and optimize geothermal power cycles 13 p0031 A77-12758

Economic optimization of the energy transport component of a large distributed solar power plant 13 p0037 A77-12807

Collector field optimization for a solar thermal electric power plant 13 p0038 A77-12811

Optimizing solar cooling systems 13 p0047 A77-13502

Dual optimum aerodynamic design for a conventional windmill 13 p0048 A77-13704

Optimization of the geometry of switching buses for thermoelements in thermoelectric generators 13 p0052 A77-14951

Theoretical aspects of optimization of aviation gas turbine engine design variables 13 p0063 A77-17762

Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814

Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost 14 p0154 A77-21845

Simulation and cost optimization of solar heating of buildings in adverse solar regions 14 p0180 A77-25897

Windmill optimization 14 p0183 A77-26086

Solar thermal electric power systems - Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474

Solar heating in the United States [ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513

Optimal mass flow rates through flat plate solar collector panels [ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524

Principles and application of systems in engineering as rational aid for economy, state, and research; Meeting, Bonn, West Germany, November 9, 10, 1976, Communications 14 p0191 A77-27032

Optimum solar collector operation for maximizing cycle work output 15 p0255 A77-30313

Optimization of composite flywheel design 15 p0260 A77-31044

Optimal tap water heating 15 p0261 A77-31375

Performance optimization of an air-to-air missile design 15 p0289 A77-34298

An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207

Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804

Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell 16 p0500 A77-50200

Pumped storage optimization in generation systems 16 p0506 A77-51284

Optimized selective coatings for solar collectors [NASA-TM-X-73498] 13 p0097 A77-11529

Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames [PB-259911/6] 14 p0234 A77-20639

A simple approach to metal hydride alloy optimization 14 p0243 A77-21624

Optimization of fusion-driven fissioning systems [FPPI-12E5] 15 p0342 A77-22469

An economic analysis of solar water and space heating [DSE/2322-1] 15 p0363 A77-24588

Optimization technique for geothermal power plants using a binary fluid cycle [BNWL-2155] 15 p0394 A77-27546

Optimization models for planning economic development [AD-A039165] 16 p0531 A77-31024

Power loss problems in EXTRAP coil systems [TRITA-PP0-77-02] 16 p0549 A77-32910

## ORBITAL ASSEMBLY

The construction of satellite solar power stations from non-terrestrial materials [AIAA PAPER 77-354] 13 p0066 A77-18259

Fabrication and assembly of large composite structures in space [AIAA PAPER 77-543] 15 p0266 A77-32065

New options for satellite power systems /SPS/ [AIAA PAPER 77-1028] 16 p0419 A77-43392

Power satellite construction location considerations --- orbital assembly for solar energy conversion 16 p0463 A77-48869

Solar power satellite construction - Issues and needed technology 16 p0464 A77-48873

Space construction base operations in support of solar power satellite development 16 p0468 A77-48907

The assembly of large structures in space --- radio astronomy telescope and microwave antenna 16 p0524 A77-29770

## ORBITAL MECHANICS

Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis of orbital systems [NASA-CR-150147] 13 p0129 A77-15495

Technology requirements for advanced earth-orbital transportation systems: Summary report --- single stage to orbit vehicles [NASA-CR-2867] 16 p0550 A77-33255

## ORBITAL SPACE STATIONS

Solar electric power generating stations in space - XXI century energy or a utopia 15 p0269 A77-32470

A preliminary cost benefit analysis of space colonization 16 p0431 A77-46771

A space station for the 1980's - A look at the next generation of operational systems and their functional requirements [ASME PAPER 77-ENAS-37] 16 p0432 A77-46878

Space station systems analysis study. Part 1, volume 1: Executive study [NASA-CR-151102] 13 p0094 A77-11084

Space station systems analysis study. Part 1, volume 2: Technical report [NASA-CR-151103] 13 p0094 A77-11085

An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-152688] 15 p0343 A77-22612

## ORGANIC CHEMISTRY

Thermal alteration of young kerogen in relation to petroleum genesis 13 p0053 A77-15044

A petroleum substitute - Active CO2 14 p0200 A77-29325

## ORGANIC COMPOUNDS

Organic Rankine Cycle Engine development and solar energy utilization 13 p0077 A77-19096

Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis 15 p0298 A77-36254

The potential of lignocellulosic materials for the production of chemicals, fuels, and energy [PB-264458/1] 15 p0385 A77-26698

Photon energy storage in organic materials: The case of linked anthracenes [AD-A039702] 16 p0535 A77-31615

## ORGANIC COOLED REACTORS

Reactor hybrid-Organic Rankine Cycle Electric Power Systems /ORCEPS/ for space applications 16 p0463 A77-48858

## ORGANIC LIQUIDS

Solution of silica in Green River oil shale 14 p0169 A77-23558

## ORGANIC MATERIALS

A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673

- Startup solvent selection for the liquefaction of lignite 13 p0059 A77-16472
- ORGANIC WASTES (FUEL CONVERSION)**
- A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673
- Fuel gas recovery from controlled landfilling of municipal wastes 13 p0070 A77-18739
- Demonstration of pyrolysis and materials recovery in San Diego, California 14 p0137 A77-20521
- Energy balance for anaerobic digestion 14 p0138 A77-20999
- Heat and mass transfer problems associated with alternative energy production 14 p0176 A77-24216
- Methane gas recovery from sanitary landfills in Southern California 14 p0182 A77-26077
- Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078
- Energy from bio-conversion for developing countries 15 p0270 A77-32592
- Energy from wood wastes 15 p0273 A77-33301
- Torrax - A system for recovery of energy from solid waste. P. J. Page 15 p0293 A77-35163
- Decision making in the utilisation of the organic fraction of municipal wastes 15 p0299 A77-36272
- Economic feasibility of the conversion of organic waste to fuel oil and pipeline gas 15 p0302 A77-36346
- Wastes and biomass as energy resources - An overview 15 p0313 A77-37654
- Resource recovery and flash pyrolysis of municipal refuse 15 p0313 A77-37657
- SWG from refuse and sewage sludge by the BIOGAS process 15 p0314 A77-37659
- Synthetic natural gas from animal wastes by anaerobic fermentation 15 p0314 A77-37660
- Federal Fuels from Biomass Energy Program 15 p0315 A77-37670
- Large scale hydrogen production utilizing carbon in renewable resources 15 p0321 A77-38527
- Producer gas from agricultural wastes - Its production and utilization in a converted oil-fired boiler 15 p0323 A77-39106
- Packed bed digestion of solid wastes 15 p0323 A77-39107
- Photosynthetic solar energy - Rediscovering biomass fuels 16 p0421 A77-44396
- Waste resources - Problems and promise --- for urban energy conversion [ASME PAPER 77-ENAS-49] 16 p0432 A77-46890
- Energy and resource recovery from solid wastes 16 p0434 A77-47215
- Methane production from solid waste 16 p0434 A77-47218
- Anaerobic sludge digestion - A potential energy source 16 p0439 A77-47970
- Methane production through bioconversion of agriculture residues 16 p0489 A77-49081
- A bioenvironmental study of emissions from refuse derived fuel [AD-A024661] 13 p0110 N77-12571
- Energy recovery through biogasification of municipal solid wastes and utilization of thermal wastes from an energy-urban-agro-waste complex 15 p0358 N77-24008
- Method and equipment for the introduction of liquid waste fuels into a fluidized layer [BLL-BTS-10400] 15 p0359 N77-24205
- Heat treatment of refuse for increasing anaerobic biodegradability 16 p0550 N77-32995
- Reclamation of energy from solid waste: Theory and practice. A selected, annotated bibliography for Pennsylvania local government officials [PB-267800/1] 16 p0555 N77-33621
- ORGANIZATIONS**
- General Electric Company survey to define impact of statewide building codes on solar HVAC systems, commercial buildings. National Solar Demonstration Program [COO-2683-76-11] 15 p0383 N77-26674
- ORGANOMETALLIC COMPOUNDS**
- High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741
- Investigation of acid-resistant electrocatalysts for fuel cells [NASA-TT-P-17367] 14 p0207 N77-16444
- ORTHO PARA CONVERSION**
- A study of the efficiency of hydrogen liquefaction --- jet aircraft applications 15 p0279 A77-33377
- OSCILLATING FLOW**
- A comparison between experimental and numerical investigations of the motion of the water surface in a model surge tank 16 p0505 A77-51257
- Experimental research of oscillations in the discharge gap of plasma accelerator [IAP PAPER 77-104] 16 p0507 A77-51431
- OSMOSIS**
- The Osmotic power plant 13 p0021 A77-12668
- The palirrhrotrophic origin of energy metabolism --- chemosmotic precursor to phototropism in estuarine cellular organisms 13 p0064 A77-17895
- OTTO CYCLE**
- An Otto for the automobile. II --- comparing engines utilizing different configurations and thermodynamic cycles 15 p0273 A77-33302
- OXIDATION**
- A combined cycle with a partial-oxidation reactor 13 p0062 A77-17534
- Anodic oxidation of ethylene glycol with noble metal alloy catalysts --- in fuel cell 15 p0260 A77-31171
- Further studies on the oxidation of sulfur dioxide in coal-fired power plant plumes 15 p0333 A77-39657
- Tropospheric oxidation H2S 16 p0411 A77-44254
- Catalytic action of combustion-product deposits in the oxidation of SO2 to SO3 within the combustion chambers and exhaust channels of thermoelectric plants 16 p0420 A77-44179
- Reversible oxidation of metal oxides for thermal energy storage 16 p0492 A77-49110
- Carbon oxidation catalyst mechanism study for fuel cells [PB-256420/1] 13 p0115 N77-13551
- Technology and economics of flue gas NOx oxidation by ozone [PB-261917/9] 15 p0350 N77-22700
- Oxidation of sulfur dioxide in power plant plumes [BNL-21698] 15 p0386 N77-26713
- OXIDATION-REDUCTION REACTIONS**
- Electrical conductivity of molten coal slags containing potassium seed 15 p0330 A77-39565
- The Redox flow system for solar photovoltaic energy storage [NASA-TN-X-73562] 13 p0106 N77-12522
- An improved electrolyte for direct oxidation fuel cells [AD-A026164] 13 p0131 N77-15518
- OXIDE FILMS**
- Operation of ITO/Si heterojunction solar cells 13 p0014 A77-11762



Study of cathode spots in the presence of slag films on the electrodes of an open-cycle MHD generator 13 p0053 A77-15005

Improving MIS silicon solar cells by HF-treatment of the insulating oxide layer 14 p0151 A77-21819

Tunnel MIS solar cells 14 p0163 A77-22979

Temperature dependence of the 10.6-microns reflectivity of ITO-coated silicon --- selective absorber for solar energy conversion application 14 p0200 A77-29246

Indium-tin-oxide-silicon heterojunction photovoltaic devices 15 p0259 A77-30735

Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells 15 p0259 A77-30736

Oxidation-erosion of materials in high velocity hot gases 15 p0270 A77-32604

The sawtooth coverslide - A new means of coupling light into solar cells 15 p0298 A77-36263

Analytical and experimental treatment of a spray-on selective coating - Application to collector design 16 p0487 A77-49064

Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films --- of solar collectors 16 p0502 A77-50281

Efficient sprayed In<sub>2</sub>O<sub>3</sub>:Sn n-type silicon heterojunction solar cell 16 p0503 A77-50292

Stainless steel panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-RFS-23518-2] 16 p0535 A77-31611

**OXIDIZERS**

Solar energy depot --- using liquid hydrogen as fuel and oxygen as oxidizer [AIAA PAPER 77-726] 15 p0311 A77-37251

The oxidant formation potential of emissions from catalyst-equipped vehicles 15 p0333 A77-39596

**OXYGEN**

Oxygen accumulation and electrolyte loss in nickel hydrogen cells 14 p0195 A77-28157

Considerations on coal gasification 15 p0266 A77-32169

An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 15 p0283 A77-33406

Multi-stage activation of brown-coal chars with oxygen 16 p0401 A77-41319

**OXYGEN COMPOUNDS**

Electric current from the direct conversion of low molecular weight C,H,O-compounds 13 p0055 A77-15814

**OXYGEN CONSUMPTION**

Pace and grade related to the oxygen and energy requirements, and the mechanics of treadmill running 15 p0396 A77-27689

**OXYGEN PLASMA**

Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator [NASA-TN-D-8374] 14 p0213 A77-17852

**OXYGEN PRODUCTION**

Hydrogen and oxygen from water 16 p0430 A77-46573

**OZONATES**

Technology and economics of flue gas NO<sub>x</sub> oxidation by ozone [PB-261917/9] 15 p0350 A77-22700

**OZONE**

Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub> 13 p0013 A77-11568

**OZONOMETRY**

Energy and technology review --- measurement of lunar subsurface temperature and monitoring of atmospheric ozone [UCRL-52000-76-11] 15 p0396 A77-27651

## OZONOSPHERE

Effects of nitrogen fertilizers and combustion on the stratospheric ozone layer 15 p0290 A77-34895

## P

## P-I-N JUNCTIONS

Amorphous silicon solar cells 15 p0259 A77-30733

## P-N JUNCTIONS

Influence of doped-layer parameters on photoelectric characteristics of silicon photovoltaic cells 13 p0014 A77-11916

Spectral response of a laterally illuminated p-n junction --- as photodetector or photovoltaic energy converter 13 p0062 A77-17478

An analysis of silicon solar cell parameters for terrestrial applications 13 p0076 A77-19081

Investigation on the crystalline structure of Cu<sub>x</sub>/S-CdS solar cells 14 p0149 A77-21803

Optimal parameters for solar cell films 14 p0150 A77-21805

Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815

Heterostructures for silicon solar cells 14 p0151 A77-21817

Increase of diffusion lengths of minority carriers under the effect of a width gradient of the forbidden band 14 p0151 A77-21823

Analysis of silicon solar cells with stripe geometry junctions 14 p0156 A77-22079

High efficiency n-CdS/p-InP solar cells prepared by the close-spaced technique 14 p0156 A77-22081

Improved theory of the silicon p-n junction solar cell 14 p0166 A77-23364

Performance of n/+/-p silicon solar cells in concentrated sunlight 15 p0258 A77-30729

Silicon solar cells on unidirectionally recrystallized metallurgical silicon 15 p0258 A77-30731

Fabrication and characterization of thin-film silicon solar cells on alumina ceramic 15 p0258 A77-30732

Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741

Photovoltaic properties and junction formation in CuInSe<sub>2</sub> 15 p0305 A77-36584

N-indium tin oxide/p-indium phosphide solar cells 15 p0317 A77-38049

CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567

High-efficiency GaInAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741

Hydrogen and electricity from water and light 16 p0430 A77-46609

On the analysis and design of grid structures for p-n junction solar cells 16 p0497 A77-49156

Studies of silicon p-n junction solar cells --- open circuit photovoltage [NASA-CR-149669] 14 p0215 A77-18557

## P-TYPE SEMICONDUCTORS

The theory of hydrogen production in a photoelectrochemical cell 15 p0279 A77-33370

N-indium tin oxide/p-indium phosphide solar cells 15 p0317 A77-38049

Theoretical treatment of the photoelectrochemical production of hydrogen --- semiconductor electrode for solar applications 15 p0321 A77-38530

Analysis of the fill factor for n-CdS/p-CdTe solar cells 16 p0402 A77-41433

## PACIFIC NORTHWEST (US)

Pacific Northwest geothermal: 1976 review, 1977 outlook

15 p0335 A77-39817

Pacific northwest regional assessment program

[BNWL-2084]

16 p0540 A77-31674

## PACKAGING

The potential for reusable homogeneous containers

[PB-265100/8]

16 p0518 A77-29007

## PAKISTAN

Hydel and solar power for Pakistan --- hydroelectric power

13 p0079 A77-19121

## PAPERS

Environmental considerations of selected energy conserving manufacturing process options.

Volume 5: Pulp and paper industry report

[PB-264271/8]

15 p0384 A77-26682

## PARABOLIC BODIES

Reduced drag, paraboloid type, solar energy collectors

16 p0473 A77-48951

## PARABOLIC REFLECTORS

Ideal concentrators for finite sources and restricted exit angles --- parabolic solar collector

13 p0003 A77-10835

Radiant-vector distribution in the radiant field of a parabolocylindric concentrator

13 p0015 A77-11920

Calculations on an optimized faceted solar concentrator

13 p0015 A77-11921

Performance analysis of a cylindrical parabolic focusing collector and comparison with experimental results

13 p0019 A77-12410

Development of compound parabolic concentrators for solar-thermal electric and process heat applications

13 p0038 A77-12812

Double-reflection solar energy concentrators

13 p0074 A77-19067

Efficiency tests on a linear parabolic concentrator for medium and high temperatures

13 p0077 A77-19103

Optical and thermal properties of Compound Parabolic Concentrators

14 p0157 A77-22641

Method of designing profiles of focusing concentrators and focusing wedges --- for parabolic solar concentrators

14 p0179 A77-25355

Development of compound parabolic concentrators for solar thermal applications [ASME PAPER 76-WA/SOL-11]

14 p0189 A77-26516

Concentration of scattered radiation --- by solar collectors

15 p0316 A77-37768

Analysis of a faceted concentration system

15 p0316 A77-37769

Conceptual design of a parabolic dish solar collector using simulation techniques

15 p0318 A77-38211

Method for calculating the profiles of focones and foclines --- for parabolic solar concentrators

16 p0409 A77-41905

Design of pointed solar concentrators

16 p0417 A77-42954

Optical performance of fixed zenith-moving azimuth parabolocylindrical concentrator

16 p0417 A77-42955

On the performance of cylindrical parabolic solar concentrators with flat absorbers

16 p0422 A77-44084

Concentration of diffuse radiation --- by solar collectors

16 p0437 A77-47424

Analyzing multifacet concentrating systems --- solar energy application

16 p0437 A77-47425

Shortened focusing concentrators and focusing wedges --- solar energy technology

16 p0442 A77-48521

Optimum operating conditions for a cylindrical parabolic focusing collector/Rankine power generation cycle system

16 p0468 A77-48905

A compound parabolic concentrator array optimized for northern climates --- cold weather effects on solar collectors

16 p0474 A77-48958

Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications

16 p0483 A77-49031

Prisms with total internal reflection as solar reflectors

16 p0488 A77-49071

On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices

16 p0488 A77-49073

A note of the economics of deep cylindrical mirror concentrating collectors

16 p0502 A77-50218

Sun tracking solar energy collector

[NASA-CASE-WPO-13921-1]

15 p0363 A77-24590

## PARABOLOID MIRRORS

Energetic calculation of the concentrating capacity of paraboloidal facets

13 p0051 A77-14579

Standard-size facets for the reflecting surface of a solar concentrator

13 p0063 A77-17557

A Cassegrain system for solar radiation

13 p0063 A77-17561

Design and fabrication of solar concentrators

13 p0074 A77-19062

An inflatable solar concentrator for a high temperature storage system

13 p0074 A77-19064

Experimental evaluation of a cylindrical parabolic solar collector

[ASME PAPER 76-WA/HT-13]

14 p0186 A77-26473

Solar flux density distributions on central tower receivers

15 p0256 A77-30318

Non-focussing solar concentrators of easy manufacture

15 p0256 A77-30322

The use of lasers for the inspection of heliotechnical reflectors

15 p0286 A77-33432

Paraboloid-hyperboloid concentrating systems and their accuracy

15 p0286 A77-33433

Energy computation of concentrating capability of paraboloidal facets

15 p0290 A77-34973

1-MW solar boiler tested

15 p0303 A77-36349

Using lasers to inspect solar-energy reflectors

16 p0427 A77-45545

Paraboloid-hyperboloid concentrating systems and their accuracy

16 p0427 A77-45546

The cylindrical parabolic mirror as reflector for solar collectors. Efficiencies and optimization [DLR-PB-76-55]

14 p0233 A77-20607

The cylindrical parabolic mirror as reflector for solar collectors-efficiencies and optimization [ESA-TT-365]

15 p0365 A77-24615

## PARAFFINS

Fiat petrol engine performance with a mixture of basil extract with petrol

14 p0179 A77-25196

Two component thermal energy storage material [PB-252592/1]

13 p0090 A77-10675

Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings [PB-254665/3]

13 p0091 A77-10689

## PARASITIC FREQUENCY CONVERTERS

New modes of operation for avalanche diodes - Frequency multiplication and upconversion

13 p0049 A77-14261

## PARKS

Photovoltaic applications for the National Park Service

16 p0460 A77-48837

## PARTIAL PRESSURE

Investigation of gas-controlled heat pipes with reservoirs of constant and variable volume

13 p0050 A77-14327

**PARTICLE ACCELERATORS**

Particle Accelerator Conference: Accelerator Engineering and Technology, Chicago, Ill., March 16-18, 1977, Proceedings

15 p0334 A77-39742

**PARTICLE EMISSION**

Influence of heavy fuel oil composition and boiler combustion conditions on particulate emissions

13 p0008 A77-11162

Chemical characterization of diesel exhaust

particulates  
[PERC/R1-77/5]

16 p0540 N77-31671

**PARTICLE ENERGY**

A direct converter based upon space charge effects

14 p0184 A77-26160

**PARTICLE SIZE DISTRIBUTION**

Influence of heavy fuel oil composition and boiler combustion conditions on particulate emissions

13 p0008 A77-11162

Black magnetic spherule fallout in the eastern Gulf of Mexico

13 p0052 A77-14890

Composition and size distribution of in-stack particulate material at a coal-fired power plant

14 p0139 A77-21018

Particulate nature of solar absorbing films - Gold black

14 p0163 A77-22982

Particle size distributions of dusts in the flue gas of power plants and in atmospheric air

15 p0265 A77-31889

In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures

16 p0440 A77-48173

Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator

16 p0508 A77-51611

Design of minimum-weight diffusion batteries

16 p0518 N77-28645

**PARTICLES**

Size distribution and mass output of particulates from diesel engine exhausts

[PB-261416/2] 15 N77-22732

Development of procedures for the measurement of fugitive emissions

[PB-263592/0] 15 p0368 N77-24671

EPA and ERCA high-temperature/high-pressure particulate control programs

[PB-266231/0] 16 p0517 N77-28644

**PARTICULATE SAMPLING**

Compilation of an inventory for particulate emissions in Belgium

13 p0009 A77-11271

Composition and size distribution of in-stack particulate material at a coal-fired power plant

14 p0139 A77-21018

Particulate sampling at high temperature and high pressure --- of coal conversion processes

15 p0293 A77-35172

**PASSENGER AIRCRAFT**

Application of advanced technology to future long-range aircraft

[SAWE PAPER 1126] 13 p0016 A77-12194

The technical concept of the IL-62M. II - Fuel system

14 p0156 A77-22120

**PASSIVITY**

Heat pipe materials compatibility

[NASA-CR-135069] 13 p0103 N77-12182

**PATENT APPLICATIONS**

Auxiliary power system for activity cooled aircraft

[NASA-CASE-LAR-11626-1] 13 p0103 N77-12332

**PATTERN RECOGNITION**

Classification of oils by the application of pattern recognition techniques to infrared spectra

[AD-A039387] 16 p0531 N77-30841

**PAYLOADS**

Air New Zealand's methods of flying the DC-10

[AIAA PAPER 77-1255] 16 p0421 A77-44343

The International Heat Pipe Experiment --- Black Brant sounding rocket payload zero gravity experiment

13 p0120 N77-14389

**PDP 11/40 COMPUTER**

Computer model of a solar-assisted heating design approach implemented on a minicomputer installation

15 p0318 A77-38178

**PENDULUMS**

Whirl stability of the pendulously supported flywheel system

[ASME PAPER 77-APM-20] 15 p0343 A77-38837

**PENNSYLVANIA**

Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act

[E77-10007] 13 p0085 N77-10590

Characterization and evaluation of wastewater sources United States Steel Corporation,

Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976

[PB-255586/0] 13 p0116 N77-13566

Interpretation of Pennsylvania agricultural land use from ERTS-1 data

[E77-10111] 14 p0215 N77-18525

Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work.

Analysis of the Philadelphia-Lindenwold high-speed line

[PB-263048/1] 15 p0370 N77-25014

**PERFORMANCE PREDICTION**

Performance theory of diagonal conducting wall MHD generators -

13 p0001 A77-10202

Solar thermal electric power plants - Their performance characteristics and total social costs

13 p0037 A77-12804

Long term performance prediction of residential solar energy heating systems

13 p0039 A77-12822

A simplified method in flight test techniques for the determination of the range performance of jet aircraft

13 p0060 A77-16600

Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials

13 p0068 A77-18444

Axial conduction in a flat-plate solar collector

13 p0068 A77-18447

Arrays of fixed flat-plate solar energy collectors - Performance comparisons for differing individual component orientations

13 p0068 A77-18449

General Motors Sulfate Dispersion Experiment - Assessment of the EPA HIWAY model

13 p0071 A77-18882

Performance of an annular cylindrical solar collector

13 p0073 A77-19059

Heterojunctions in photovoltaic devices

14 p0162 A77-22977

Method for estimating solar heating and cooling system performance

14 p0170 A77-23653

Generalized analysis of thermoelectric device configurations

14 p0177 A77-24572

Analysis of the wind-driven reciprocator

14 p0183 A77-26088

Performance of flat-plate collectors with planar reflectors

[ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478

Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions

[ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508

The consideration of climatic data in the prediction of solar-system performance --- for energy conversion

14 p0202 A77-29569

Calculation of long term solar collector heating system performance

15 p0255 A77-30311

Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data

15 p0256 A77-30315

Matching of solar cells and performance of a solar battery

15 p0256 A77-30316

Fundamental electronic mechanisms limiting the performance of solar cells

15 p0257 A77-30710

Performance limitations of silicon solar cells

15 p0257 A77-30711

# PERFORMANCE TESTS

# SUBJECT INDEX

Collection efficiency of heterojunction solar cells  
15 p0258 A77-30722

Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975  
15 p0282 A77-33396

Performance optimization of an air-to-air missile design  
15 p0289 A77-34298

Conceptual design of a parabolic dish solar collector using simulation techniques  
15 p0318 A77-38211

The influence of parameter dispersion of electrical cells on the array power output  
16 p0420 A77-44264

Autocorrelation and stochastic modelling of insolation sequences --- for solar thermal systems  
16 p0422 A77-44479

Comparison of predicted performance of constant outlet temperature and constant mass flow rate collectors --- for solar energy conversion  
16 p0423 A77-44489

The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report  
[SAE PAPER 770081]  
16 p0424 A77-44559

Coal gasification combined-cycle pilot plant system analysis  
16 p0446 A77-48724

The design of a sodium sulfate decahydrate heat exchanger for coolness storage --- in solar-powered air conditioning system  
16 p0450 A77-48760

Combined diesel-organic Rankine-cycle power plant  
16 p0459 A77-48830

Solar powered steam generation  
16 p0459 A77-48832

Dynamic modeling and sensitivity analysis of solar thermal energy conversion systems  
16 p0461 A77-48845

Deterministic insolation estimates for solar total energy systems  
16 p0462 A77-48847

Some contributions to aerodynamic theory for vertical axis wind turbines  
16 p0467 A77-48897

An averaging technique for predicting the performance of a solar energy collector system  
16 p0480 A77-49008

Solar energy for process heat  
16 p0481 A77-49020

Shallow solar ponds for industrial process heat - The ERDA-Sohio project  
16 p0482 A77-49024

A generalized numerical model for predicting energy transfers and performance of large solar ponds  
16 p0482 A77-49025

Experience with a prototype solar pond for space heating  
16 p0482 A77-49026

Assuring the performance of fossil energy programs  
16 p0503 A77-50499

Investigation of performance limits in axial groove heat pipes  
[NASA-CR-137912]  
13 p0095 A77-11340

Method for estimating solar heating and cooling system performance  
[AD-A026041]  
13 p0116 A77-13557

Cell and module test procedures seen from the manufacturer and the user point of view  
16 p0527 A77-30537

Recommendations for the performance rating of flat plate terrestrial photovoltaic solar panels  
16 p0527 A77-30539

DoD energy R And D. Part 2: Military fuel operations. Performance and R and D implications  
[AD-A042272]  
16 p0554 A77-33617

**PERFORMANCE TESTS**

A method of testing for rating solar collectors based on thermal performance  
13 p0019 A77-12408

Selection of driving cycles for electric vehicles of the 1990's  
13 p0024 A77-12702

Baseline test data for the EVA electric vehicle --- low energy consumption automobiles  
13 p0025 A77-12704

A unique Rankine-cycle heat pump system  
13 p0036 A77-12799

Comparative performance of solar thermal power generation concepts  
13 p0036 A77-12803

Design and performance of thermal storage water tank  
13 p0075 A77-19079

Efficiency tests on a linear parabolic concentrator for medium and high temperatures  
13 p0077 A77-19103

Effects of one-sided heat input and removal on axially grooved heat pipe performance  
[AIAA PAPER 77-191]  
14 p0135 A77-19887

Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility  
14 p0139 A77-21215

Progress on the Mark VI long-duration MHD generator  
14 p0141 A77-21237

The ONERSOL collector and its performance --- solar energy conversion  
14 p0150 A77-21809

Performance rating of photovoltaic solar generators for terrestrial applications  
14 p0153 A77-21837

User experience with the Enfield car --- electric motor vehicle  
14 p0159 A77-22884

On-the-road evaluation of the efficiency of propulsion system of city vans  
14 p0160 A77-22888

The M.A.N. electrobus experience gained in large-scale tests  
14 p0160 A77-22900

Electric delivery vans above the 45th parallel in North America  
14 p0162 A77-22917

Initial test results for a solar-cooled townhouse in the mid-Atlantic region  
14 p0170 A77-23655

Experimental measurements and system implications of the performance of flat plate solar collector configurations  
[ASME PAPER 76-WA/SOL-14]  
14 p0189 A77-26519

Analysis of thermal performance of 'Solaris' water-trickle solar collector  
[ASME PAPER 76-WA/SOL-21]  
14 p0190 A77-26526

The determination of the performance characteristics of solar collectors  
14 p0203 A77-29573

Progress in channel development for direct coal fired MHD  
16 p0458 A77-48824

Tests and evaluation of multihundred watt thermoelectric generators at JPL  
16 p0462 A77-48854

Performance and analysis of 'Solaris' water-trickle solar collector  
16 p0472 A77-48939

Performance of an evacuated tubular collector using non-imaging reflectors  
16 p0472 A77-48940

Performance of air-cooled flat plate collectors  
16 p0472 A77-48942

Predicted daily and yearly average radiative performance of optimal trapezoidal groove solar energy collectors  
16 p0472 A77-48943

Thermal, fluid flow and mechanical performance characteristics of a subatmospheric pressure, distributed flow flat plate collector  
16 p0473 A77-48945

A proposed method of rating the thermal performance of solar collectors  
16 p0473 A77-48946

An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator  
16 p0473 A77-48952

The performance of a stationary reflector/tracking absorber solar concentrator  
16 p0474 A77-48954

Standardized performance tests of collectors of solar thermal energy - A flat-plate copper collector with parallel mylar striping  
[NASA-TN-X-73553]  
13 p0114 A77-13535

Standardized performance tests of collectors of solar thermal energy: An evacuated flatplate copper collector with a serpentine flow distribution  
[NASA-TN-X-73415]  
13 p0114 A77-13536

- Effect of ceramic coating of JT8D combustor liner on maximum liner temperatures and other combustor performance parameters  
[NASA-TN-X-73581] 13 p0126 N77-15037
- Comparing the electric lead-acid battery vehicle with a hydrogen fueled vehicle incorporating an Fe-Ti hydride storage unit  
[BNL-20990] 14 p0211 N77-17577
- Geothermal component test facility  
[TID-27035] 14 p0211 N77-17580
- Performance test of a bladeless turbine for geothermal applications  
[UCID-17068] 14 p0212 N77-17581
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle  
[UCRL-78390] 14 p0221 N77-19587
- An economic and performance design study of solar preheaters for domestic hot water heaters in North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- Summer performance results obtained from simultaneously testing ten solar collectors outdoors  
[NASA-TN-X-73594] 14 p0229 N77-20563
- Performance and analysis of SOLARIS water-trickle solar collector  
[CONF-760821-9] 14 p0232 N77-20599
- Evaluation of the solar heating system in the Lof residence, Denver, Colorado  
[PB-258845/7] 14 p0233 N77-20617
- Safety flywheel  
[NASA-CASE-EQN-10888-1] 15 p0342 N77-22484
- Performance of Army engines with unleaded gasoline-field study evaluation  
[AD-A032075] 15 p0342 N77-22490
- Geothermal hot water pump, appendix  
[PB-262030/0] 15 p0347 N77-22652
- Baseline performance of solar collectors for NASA Langley solar building test facility  
[NASA-TN-X-3505] 15 p0363 N77-24587
- United States special format report: Performance of the Solar Solar Water Heating System using large area plastic collectors (Grants, New Mexico)  
[SAR/1038-76/1] 15 p0365 N77-24606
- Optimization of PT-doped Kccite (R) trademark electrodes in H3 PO4 fuel cells  
[AD-A034604] 15 p0365 N77-24618
- Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles  
[CONF-760617-3] 16 p0535 N77-31618
- PERIODIC VARIATIONS**  
Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking  
[NASA-CASE-MPS-23267-1] 14 p0228 N77-20401
- PERIODICALS**  
Energy and technology review --- measurement of lunar subsurface temperature and monitoring of atmospheric ozone  
[UCRL-52000-76-11] 15 p0396 N77-27651
- Dimensions. Volume 61, number 3 --- with emphasis on air pollution control  
[PB-266957/6] 16 p0531 N77-31019
- Dimensions, volume 61, no. 5  
[PB-267321/8] 16 p0542 N77-32027
- PERMAFROST**  
Numerical solution of heat conduction with phase change in cylindrical systems  
16 p0543 N77-32422
- PERMEABILITY**  
Energy savings by application of knowledge of building physics. I - Wall permeability and its significance for the atmospheric conditions in the building interior, the design and the thermal characteristics of windows, problems concerning the permeability of the joints  
15 p0261 A77-31373
- PEROXIDES**  
Reversible oxidation of metal oxides for thermal energy storage  
16 p0492 A77-49110
- PERSONNEL**  
Techniques for the analysis of total energy and labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- PERTURBATION THEORY**  
Perturbation analysis of second-order effects in kinetics of oil-shale pyrolysis  
13 p0070 A77-18585
- PETROLOGY**  
Thermal properties of subsurface rocks in the Ukraine  
16 p0443 A77-48647
- Petrology and geochemistry of hydrothermal alteration in borehole Mesa 6-2, East Mesa geothermal area, Imperial Valley, California  
[PB-258871/3] 14 p0215 N77-18541
- PHASE DEVIATION**  
A new mathematical model for Stirling cycle machines  
16 p0465 A77-48884
- PHASE TRANSFORMATIONS**  
A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material  
[ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- Performance of a solar heating system utilizing phase-change energy storage  
16 p0480 A77-49004
- High temperature thermal energy storage  
16 p0491 A77-49099
- Inorganic phase change materials for energy storage in solar thermal program  
16 p0492 A77-49103
- Thermal storage in metals  
16 p0492 A77-49105
- Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings  
[PB-254665/3] 13 p0091 N77-10689
- Numerical solution of heat conduction with phase change in cylindrical systems  
16 p0543 N77-32422
- PHASED ARRAYS**  
Phase conjugation method and apparatus for an active retrodirective antenna array  
[NASA-CASE-MPO-13641-1] 15 p0360 N77-24340
- PHILOSOPHY**  
Energy technologies for the west: What impact could energy technology development have on the quality of life  
[TID-27428] 16 p0538 N77-31645
- PHOSPHORIC ACID**  
Improvement in phosphoric acid cell powerplant technology  
[AIAA 77-1011] 16 p0403 A77-41558
- Fuel cell stacks  
[AD-A024216] 13 p0090 N77-10684
- Fuel cell stacks  
[AD-A030375] 14 p0213 N77-17603
- Fuel cell stacks  
[AD-A037586] 15 p0380 N77-26641
- Environmental considerations of selected energy conserving manufacturing process options. Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 N77-26690
- PHOSPHORUS**  
Environmental considerations of selected energy conserving manufacturing process options. Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 N77-26690
- PHOTOABSORPTION**  
Optical properties of selectively absorbing Ni/Al2O3 composite films --- of solar collectors  
16 p0502 A77-50281
- PHOTOCATHODES**  
Cathodes for photodriven hydrogen generators - ZnTe and CdTe  
15 p0296 A77-35921
- Hydrogen and electricity from water and light  
16 p0430 A77-46609
- PHOTOCHEMICAL REACTIONS**  
Photosynthesis as a resource for energy and materials  
13 p0017 A77-12233
- Photoassisted electrolysis of water - Conversion of optical to chemical energy  
13 p0021 A77-12666
- Chemical evolution of photosynthesis  
13 p0071 A77-18898
- The theory of hydrogen production in a photoelectrochemical cell  
13 p0075 A77-19075

- Solar energy utilization - The photochemical approach 13 p0075 A77-19076
- The photosynthetic production of hydrogen 13 p0075 A77-19077
- Description of a new photoelectrochemical generator 14 p0150 A77-21812
- Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813
- Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814
- Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy 15 p0274 A77-33334
- The chemical conversion of sunlight 15 p0287 A77-33598
- The oxidant formation potential of emissions from catalyst-equipped vehicles 15 p0333 A77-39596
- The use of functionalized polymers as photosensitizers in an energy storage reaction 16 p0501 A77-50208
- Photochemical conversion of solar energy [PB-255703/1] 13 p0090 N77-10685
- The theory of hydrogen production in a photoelectrochemical cell 14 p0239 N77-21604
- Photochemical conversion of solar energy [PB-262450/0] 15 p0366 N77-24628
- Photon energy storage in organic materials: The case of linked anthracenes [AD-A039702] 16 p0535 N77-31615
- PHOTOCONDUCTIVE CELLS**
- Utilization of solar power - A new departure 13 p0053 A77-15049
- PHOTOCONDUCTIVITY**
- Electronic properties of amorphous silicon in solar cell operation 15 p0257 A77-30717
- Photovoltaic II-VI compound heterojunctions for solar energy conversion [PB-259195/6] 14 p0251 N77-21702
- PHOTODIODES**
- Spectral response of a laterally illuminated p-n junction --- as photodetector or photovoltaic energy converter 13 p0062 A77-17478
- PHOTOELECTRIC CELLS**
- A multilayer iron-thionine photogalvanic cell 13 p0007 A77-11108
- The theory of hydrogen production in a photoelectrochemical cell 13 p0075 A77-19075
- Alternating photoelectrochemical converters 13 p0077 A77-19093
- Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813
- High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851
- High-sensitivity detection procedures and devices for angular variations - Application to automatic control of a solar furnace heliostat 14 p0166 A77-23386
- The theory of hydrogen production in a photoelectrochemical cell 15 p0279 A77-33370
- Photocell using covalently-bound dyes on semiconductor surfaces 16 p0412 A77-42412
- Hydrogen and electricity from water and light 16 p0430 A77-46609
- The dependence of current output of the TI-TL SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on photostationary state composition --- Totally illuminated, Thin Layer 16 p0502 A77-50220
- Hydrogen generation by photoelectrolysis of water 14 p0240 N77-21605
- PHOTOELECTRIC EFFECT**
- Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814
- Photovoltaic properties of GaSe and InSe junctions 15 p0289 A77-34117
- PHOTOELECTRIC EMISSION**
- Theoretical treatment of the photoelectrochemical production of hydrogen --- semiconductor electrode for solar applications 15 p0321 A77-38530
- PHOTOELECTRIC GENERATORS**
- Description of a new photoelectrochemical generator 14 p0150 A77-21812
- Use of transparent heat reflecting coatings in solar energy converters 15 p0285 A77-33430
- Utilization of transparent heat-reflecting coatings in solar-energy converters 16 p0426 A77-45543
- Solar energy, DFVLR activities [ERDA-TR-143] 14 p0230 N77-20575
- The theory of hydrogen production in a photoelectrochemical cell 14 p0239 N77-21604
- PHOTOELECTRIC MATERIALS**
- Photoelectrochemical energy conversion and storage - The polycrystalline CdSe cell with different storage modes 14 p0196 A77-28463
- The physical principles of photoelectric conversion 14 p0202 A77-29568
- Photovoltaic properties of five II-VI heterojunctions 14 p0205 A77-29892
- Preparation of CdS/InP solar cells by chemical vapor deposition of CdS 14 p0205 A77-29893
- Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions 16 p0442 A77-48518
- Solar cells for terrestrial applications 16 p0485 A77-49050
- EPG growth of silicon ribbon for solar cells --- Edge-defined Film-fed Crystal Growth 16 p0485 A77-49051
- Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion 16 p0485 A77-49052
- Large area Czochralski silicon for solar cells 16 p0486 A77-49054
- Basic mechanisms governing solar-cell efficiency 16 p0486 A77-49060
- PHOTOELECTRICITY**
- Energy conversion via photoelectrolysis 13 p0021 A77-12667
- The chemical conversion of sunlight 15 p0287 A77-33598
- PHOTOELECTRONS**
- Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters 15 p0320 A77-38330
- PHOTOGRAPHY**
- The uses of air photography /2nd edition/ --- Book 15 p0295 A77-35675
- PHOTOINTERPRETATION**
- Use of radar in geology 13 p0018 A77-12256
- Construction and interpretation of a digital inertia image --- of Pisgah Crater and Lavic Lake in Southern California 16 p0421 A77-44464
- Cross structural plan of the earth's crust and the problem of the manifestation of its plutonic elements on the surface (Tian-Shan and Turan plate as examples) [NASA-TT-P-16938] 13 p0117 N77-13590
- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] 16 p0527 N77-30589
- PHOTOLUMINESCENCE**
- Investigation of p-Al<sub>x</sub>Ga<sub>1-x</sub>As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra 14 p0143 A77-21311
- PHOTOLYSIS**
- Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813

- Photoelectrolysis with  $\text{YFeO}_3$  electrodes --- water splitting using solar energy 16 p0399 A77-40553
- Hydrogen quantum yields in the 360 nm photolysis of  $\text{Eu}^{2+}$  solutions and their relationship to photochemical fuel formation 16 p0501 A77-50203
- Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [DLR-FB-76-32] 13 p0114 A77-13541
- Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [ESA-TT-338] 14 p0251 A77-21701
- Solar photolysis of water [NASA-CASE-NPO-13675-1] 16 p0544 A77-32580
- PHOTOMAPPING**  
Thermographic mosaic of Yellowstone National Park p0001 A77-10121
- The uses of air photography /2nd edition/ --- Book 15 p0295 A77-35675
- LANDSAT (ERTS) used as a basis for geological volcanological mapping in the central Andes [NASA-TM-75024] 15 p0390 A77-27474
- PHOTOMETERS**  
Solar power array for the concentration of energy. Task 2: Modifications to a specular photometer [COO-2699-3] 13 p0098 A77-11538
- PHOTOMETRY**  
The geometry of catoptric light. II - An application to solar energy 16 p0417 A77-42959
- PHOTOMICROGRAPHY**  
Mechanisms of coal particle dissolution 13 p0059 A77-16475
- PHOTONS**  
Solar cell collector and method for producing same --- indium alloy coatings [NASA-CASE-LEN-12552-1] 14 p0211 A77-17564
- PHOTOOXIDATION**  
Fuel conversion strategy impacts on compliance with photochemical oxidant standards 15 p0333 A77-39585
- PHOTOSENSITIVITY**  
The use of functionalized polymers as photosensitizers in an energy storage reaction 16 p0501 A77-50208
- PHOTOSYNTHESIS**  
Photosynthesis as a resource for energy and materials 13 p0017 A77-12233
- Chemical evolution of photosynthesis 13 p0071 A77-18898
- The photosynthetic production of hydrogen 13 p0075 A77-19077
- Conversion of solar energy by photosynthetic production of molecular hydrogen 14 p0143 A77-21316
- Fuels via bioconversion 14 p0176 A77-24569
- The photosynthetic production of hydrogen 15 p0278 A77-33368
- Bioconversion of solar energy in salt water photosynthetic hydrogen production systems 15 p0278 A77-33369
- Gas production from micro algae 15 p0314 A77-37665
- Fuels from biomass - Energy outlay versus energy returns: A critical appraisal 15 p0322 A77-38673
- Earth, an open system - The use of solar energy 16 p0432 A77-46788
- The photosynthesis energy factory - Analysis, synthesis, and demonstration 16 p0449 A77-48753
- The photosynthetic production of hydrogen 14 p0239 A77-21602
- Bioconversion of solar energy in salt water: Photosynthetic hydrogen production systems 14 p0239 A77-21603
- Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-261910/4] 15 p0350 A77-22688
- Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-267937/1] 16 p0554 A77-33619
- PHOTOVOLTAGES**  
Studies of silicon p-n junction solar cells --- open circuit photovoltage [NASA-CR-149669] 14 p0215 A77-18557
- PHOTOVOLTAIC CELLS**  
Influence of doped-layer parameters on photoelectric characteristics of silicon photovoltaic cells 13 p0014 A77-11916
- Photovoltaic conversion of solar energy 13 p0058 A77-16368
- The lensed high-voltage vertical multijunction solar cell 13 p0069 A77-18489
- New analysis of a high-voltage vertical multijunction solar cell 13 p0069 A77-18490
- Reply to 'New analysis of a high-voltage vertical multijunction solar cell' 13 p0069 A77-18491
- Photovoltaic effect applications 13 p0075 A77-19080
- Cuprous oxide Schottky photovoltaic cells as potential solar energy converters 13 p0076 A77-19088
- Double-faced silicon solar cell system 13 p0076 A77-19090
- French developments in silicon photovoltaic cells 14 p0147 A77-21780
- Evaluation of CdS photovoltaic cells in the framework of the development of solar electric power plants 14 p0149 A77-21796
- Theoretical prospects of the  $\text{CdS-Cu}_2\text{S}$  solar cell 14 p0149 A77-21797
- Photovoltaic properties of thin-film  $\text{Cu}_2\text{S-CdS}$  heterojunctions 14 p0149 A77-21801
- Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815
- Increase of diffusion lengths of minority carriers under the effect of a width gradient of the forbidden band 14 p0151 A77-21823
- Status report on the German experimental study for terrestrial solar electric generators 14 p0153 A77-21836
- Performance rating of photovoltaic solar generators for terrestrial applications 14 p0153 A77-21837
- Photovoltaic test and demonstration project --- residential energy program 14 p0153 A77-21838
- Photovoltaic conversion of solar energy using optical concentration systems 14 p0154 A77-21849
- Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975 14 p0154 A77-21850
- Some applications of photovoltaic solar energy 14 p0155 A77-21855
- Heterojunctions in photovoltaic devices 14 p0162 A77-22977
- Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions 14 p0162 A77-22978
- Hardened solar photovoltaics [AIAA PAPER 77-484] 14 p0172 A77-23904
- Advanced silicon solar cell production technology [AIAA PAPER 77-485] 14 p0172 A77-23905
- Advanced photovoltaic power systems [AIAA PAPER 77-506] 14 p0173 A77-23923
- Consideration of encapsulants for photovoltaic arrays in terrestrial applications 14 p0203 A77-29580
- Photovoltaic properties of five II-VI heterojunctions 14 p0205 A77-29892
- Indium-tin-oxide-silicon heterojunction photovoltaic devices 15 p0259 A77-30735
- Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe 15 p0259 A77-30742
- The sawtooth coverslide - A new means of coupling light into solar cells 15 p0298 A77-36263

- Upper limit of efficiency for photovoltaic solar cells 16 p0399 A77-40568
- Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters 16 p0402 A77-41360
- The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583
- Photovoltaics - The semiconductor revolution comes to solar 16 p0407 A77-41638
- Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator 16 p0418 A77-43070
- The influence of parameter dispersion of electrical cells on the array power output 16 p0420 A77-44264
- An electrooptical model for the design of semiconductor solar cells --- French book 16 p0429 A77-46469
- Photovoltaic solar power satellites 16 p0463 A77-48866
- Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion 16 p0485 A77-49052
- Status of the ERDA photovoltaic materials and device studies 16 p0486 A77-49056
- Extension of the Hottel-Whillier-Bliss model to the analysis of combined photovoltaic/thermal flat plate collectors 16 p0486 A77-49057
- Terrestrial concentrating photovoltaic power system studies 16 p0486 A77-49058
- CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications 16 p0486 A77-49059
- On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices 16 p0488 A77-49073
- Photochemical conversion of solar energy [PB-255703/1] 13 p0090 N77-10685
- Applied research on II-VI compound [PB-254637/2] 13 p0098 N77-11547
- The redox flow system for solar photovoltaic energy storage [NASA-TM-X-73562] 13 p0106 N77-12522
- Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays [NASA-CR-149451] 13 p0106 N77-12524
- Assessment of cadmium sulfide photovoltaic arrays for large scale electric utility applications [PB-255646/2] 13 p0109 N77-12551
- Definition study for photovoltaic residential prototype system [NASA-CR-135039] 13 p0113 N77-13532
- Definition study for photovoltaic residential prototype system [NASA-CR-135056] 13 p0113 N77-13533
- Investigation of low cost solar cells based on Cu<sub>2</sub>O [PB-258583/4] 14 p0217 N77-18582
- Investigation of low cost solar cells based on Cu<sub>2</sub>O [PB-258746/7] 14 p0217 N77-18583
- Photovoltaic energy conversion using concentrated sunlight [SAND-76-5759] 14 p0225 N77-19647
- Photovoltaic II-VI compound heterojunctions for solar energy conversion [PB-259195/6] 14 p0251 N77-21702
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-152688] 15 p0343 N77-22612
- Silicon Schottky photovoltaic diodes for solar energy conversion [PB-263172/9] 15 p0357 N77-23624
- Solar breeder: Energy payback time for silicon photovoltaic systems [NASA-CR-153060] 15 p0362 N77-24581
- Method for fabricating solar cells having integral collector grids [NASA-CASE-LBW-12819-1] 15 p0363 N77-24593
- Photochemical conversion of solar energy [PB-262450/0] 15 p0366 N77-24628
- Development of a new silicon Schottky photovoltaic energy converter [PB-262491/4] 15 p0373 N77-25654
- Ternary compound thin film solar cells [PB-262536/6] 15 p0374 N77-25662
- Temperature dependence of the photovoltaic performance of Si cells under blue, white, and near-bandgap irradiation [UCRL-76203] 15 p0381 N77-26652
- Photovoltaic-powered refrigerator experiment at Isle Royale National Park [NASA-TM-73703] 15 p0390 N77-27497
- Nonbiological photochemical energy conversion, can it compete [SAND-76-5763] 15 p0393 N77-27541
- Ternary compound thin film solar cells - 1 [PB-265003/4] 15 p0395 N77-27561
- Development of low cost thin film polycrystalline silicon solar cells for terrestrial applications [PB-266057/9] 16 p0517 N77-28618
- Thin film solar cells for terrestrial applications [PB-265983/7] 16 p0523 N77-29635
- Recent developments in photovoltaic energy by ERDA/NASA-LeRC 16 p0526 N77-30277
- Recommendations for the performance rating of flat plate terrestrial photovoltaic solar panels 16 p0527 N77-30539
- Energy requirement for the production of silicon solar arrays [NASA-CR-153409] 16 p0528 N77-30604
- Development of low cost, high energy-per-unit-area solar cell modules [NASA-CR-153977] 16 p0528 N77-30605
- Engineering study of the module/array interface for large terrestrial photovoltaic arrays [ERDA/JPL-954698-77/1] 16 p0528 N77-30609
- Photovoltaic conversion program [ERDA-76-161] 16 p0538 N77-31653
- Summary report: An exploratory study of cost targets for solar electric power plants [ORNL-TM-5787] 16 p0538 N77-31654
- Evaluation of the CdS/CdTe heterojunction solar cell 16 p0545 N77-32584
- Silicon Schottky photovoltaic diodes for solar energy conversion [PB-268457/9] 16 p0547 N77-32604
- Proceedings of the ERDA Semiannual Solar photovoltaic Program Review Meeting [CONF-760837-P2] 16 p0555 N77-33628
- PHOTOVOLTAIC CONVERSION**
- Photovoltaic and thermal energy conversion for solar powered satellites [IAF PAPER 76-117] 13 p0003 A77-10913
- The ERDA Photovoltaic Systems Definition Project 13 p0038 A77-12815
- Performance and cost analysis of photovoltaic power systems for on-site residential applications 13 p0038 A77-12816
- New concepts in solar photovoltaic electric power systems design 13 p0038 A77-12817
- An integrated photovoltaic/thermal High Intensity Solar Energy System /HISES/ concept for residential applications 13 p0039 A77-12818
- Alternative strategies for implementing silicon-ribbon technology for photovoltaic applications 13 p0039 A77-12819
- Spectral response of a laterally illuminated p-n junction --- as photodetector or photovoltaic energy converter 13 p0062 A77-17478
- A sulfurization process for the preparation of photovoltaic Cu<sub>x</sub>/S and CuInS<sub>2</sub> thin films 13 p0076 A77-19087
- Photovoltaic systems using sunlight concentration 13 p0076 A77-19089
- International Conference on Solar Electricity, Toulouse, France, March 1-5, 1976, Reports 14 p0147 A77-21776
- The current status of the U.S. Photovoltaic Conversion Program 14 p0147 A77-21782



# SUBJECT INDEX

# PILOT PLANTS

Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia 14 p0153 A77-21840

The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854

Some preliminary considerations on photovoltaic conversion of solar energy 14 p0164 A77-23299

Advanced technologies for photovoltaic cell fabrication 14 p0165 A77-23300

A rationale for large space-based solar power systems [AIAA PAPER 77-510] 14 p0173 A77-23926

Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station /GSS4PS/ [AIAA PAPER 77-511] 14 p0173 A77-23927

Design considerations for high-intensity solar cells 14 p0179 A77-25591

Status of silicon solar cell technology 14 p0184 A77-26392

Development of compound parabolic concentrators for solar thermal applications [ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516

Solar generators - Utilization of solar energy for supply of electric power 14 p0197 A77-28681

Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023

Photovoltaic energy conversion using concentrated sunlight 14 p0203 A77-29579

GaAs solar cells for very high concentrations 14 p0204 A77-29581

Matching of solar cells and performance of a solar battery 15 p0256 A77-30316

Performance data for a terrestrial solar photovoltaic/water electrolysis experiment 15 p0256 A77-30321

Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741

Photovoltaic systems, --- solar energy conversion research for military applications 15 p0288 A77-34112

Photovoltaic properties of GaSe and InSe junctions 15 p0289 A77-34117

Stable semiconductor liquid junction cell with 9 percent solar-to-electrical conversion efficiency 15 p0290 A77-34429

Photovoltaic energy conversion using concentrated sunlight 16 p0402 A77-41516

Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563

Cost studies on terrestrial photovoltaic power systems with sunlight concentration 16 p0405 A77-41579

A comparison of GaAs and Si hybrid solar power systems 16 p0406 A77-41584

Solar electricity - The hybrid system approach 16 p0413 A77-42556

Environmental impact of major solar power development 16 p0452 A77-48773

Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835

Photovoltaic applications for the National Park Service 16 p0460 A77-48837

The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station 16 p0464 A77-48874

Design considerations of solar arrays for terrestrial applications 16 p0485 A77-49053

Residential application of photovoltaic energy systems 16 p0497 A77-49155

Status of the ERDA/NASA photovoltaic tests and applications project [NASA-TN-X-73567] 13 p0114 A77-13537

Composite material structures for thermophotovoltaic conversion radiator [AD-A026859] 13 p0132 A77-15519

Photovoltaic system test facility electromagnetic interference measurements [NASA-TN-X-73640] 15 p0343 A77-22608

ERDA/Lewis research center photovoltaic systems test facility [NASA-TN-X-73641] 15 p0343 A77-22609

PHOTOVOLTAIC EFFECT

Photovoltaic effect applications 13 p0075 A77-19080

Meeting electric power needs with photovoltaic power systems 13 p0076 A77-19091

Investigation of a TiO2/electrolyte solar cell and the photocatalytic water decomposition 13 p0077 A77-19094

Miniature applications for photovoltaic generators 14 p0155 A77-21853

Photovoltaic properties and junction formation in CuInSe2 15 p0305 A77-36584

Navy applications for terrestrial photovoltaic solar power [AD-A030529] 14 p0218 A77-18590

PHTHALOCYANINE

On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells 16 p0425 A77-45151

Manufacturing and evaluation of phthalocyanines as catalysts for fuel cells [BMFT-PB-T-76-25] 13 p0114 A77-13540

PHYSICAL CHEMISTRY

Feasibility study of a nuclear power-sewage treatment system for the conservation and reclamation of water resources [PB-255630/6] 13 p0126 A77-14960

PHYSICAL FACTORS

Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126

PHYSICAL PROPERTIES

The influence of the properties of coals on their conversion into clean fuels 13 p0009 A77-11245

Theoretical, numerical, and physical techniques for characterizing power plant plumes [PB-253099/6] 13 p0101 A77-11599

Energy and physics [ERDA-TN-225] 15 p0386 A77-26916

PILOT PLANTS

Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process 13 p0023 A77-12691

A study on solar tower power system 14 p0152 A77-21832

How six coal gasification processes compare economically 14 p0165 A77-23308

Gasification of Rhenish brown coal as mined 14 p0175 A77-24213

Design studies of the hydrogasification of coal 14 p0175 A77-24214

Description of thermal storage sub-system designs for ERDA's 10-MWe Solar Central Receiver Pilot Plant [ASME PAPER 76-WA/HT-68] 14 p0187 A77-26491

The SYNTHANE process - Current status --- coal gasification 14 p0192 A77-27286

The H-Coal Process --- liquefaction 14 p0192 A77-27289

The Riley-Morgan gasifier 14 p0193 A77-27298

Hydrogen production process by means of nuclear energy 15 p0273 A77-33327

Solar tower characteristics 15 p0274 A77-33333

Water electrolysis under pressure - Improvement of energy efficiency by temperature increase 15 p0277 A77-33360

- Recovering resources from urban refuse by the Bureau of Mines processes 15 p0292 A77-35158
- Energy recovery from solid waste using the Union Carbide Purox system 15 p0292 A77-35159
- Economic data for a 50,000 BPD Lurgi/Buhr gas shale oil plant 15 p0300 A77-36331
- Tidal power generation in India 15 p0310 A77-36988
- Coal gasification power generation 15 p0310 A77-37000
- The PUROX System --- solid waste partial oxidation to fuel gas 15 p0315 A77-37671
- Materials consideration for the Bigas coal gasification pilot plant [ASME PAPER 76-PVP-41] 15 p0323 A77-38825
- Thermal storage for electric utilities [AIAA 77-1009] 16 p0403 A77-41556
- Underground coal gasification - A status report 16 p0441 A77-48473
- Coal gasification combined-cycle pilot plant system analysis 16 p0446 A77-48724
- Conversion and storage of wind energy as nitrogenous fertilizer 16 p0450 A77-48762
- Pressurized fluidized bed pilot plant for production of electric power using high sulfur coal 16 p0453 A77-48782
- A central receiver solar system applicable to central power stations 16 p0483 A77-49036
- Central receiver solar thermal power 16 p0484 A77-49037
- Collector field design for a central receiver solar thermal power plant 16 p0484 A77-49039
- Gravel and liquid storage system for solar thermal power plants 16 p0491 A77-49101
- Inorganic phase change materials for energy storage in solar thermal program 16 p0492 A77-49103
- Georgia Tech 400 KWth solar thermal test facility 16 p0498 A77-49158
- Central receiver solar thermal power system, collector subsystem [SAN/1111-75/1] 14 p0230 A77-20576
- Shallow solar ponds for industrial process heat: The ERDA-SOHIO project [UCRL-78288] 14 p0232 A77-20601
- Evaluation of methods to produce aviation turbine fuels from synthetic crude oils, phase 2, volume 2 [AD-A036190] 16 p0511 A77-28325
- PIPE FLOW**
- The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements 13 p0028 A77-12735
- Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe 15 p0306 A77-36708
- Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361
- A heat transfer criterion on the geometric configuration of flat solar water heaters 16 p0472 A77-48944
- PIPELINES**
- The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements 13 p0028 A77-12735
- Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock 14 p0200 A77-29437
- Collectors, pipelines, and heat storage units made of plastics 14 p0202 A77-29567
- Selection of structural materials for hydrogen pipelines and storage vessels 15 p0281 A77-33390
- Utility facilities in transportation corridors [PB-255635/5] 13 p0C93 A77-10970
- Heat pipes for the trans-Alaska pipeline 13 p0120 A77-14388
- Selection of structural materials for hydrogen pipelines and storage vessels 14 p0243 A77-21625
- The gas supplies of interstate natural gas pipeline companies, 1975 [PB-263598/5] 15 p0360 A77-24320
- National gas flow patterns 1975: Geographic flow patterns and intercompany relationships [PB-266111/4] 16 p0512 A77-28428
- Drag reduction in cocurrent horizontal natural gas-hexane pipe flow 16 p0519 A77-29441
- PIPES (TUBES)**
- Circumferential variations of bore heat flux and outside surface temperature for a solar collector tube 16 p0429 A77-46426
- Method and equipment for the introduction of liquid waste fuels into a fluidized layer [BLL-RTS-10400] 15 p0359 A77-24205
- PISTON ENGINES**
- The performance of hydrogen-injected reciprocating engines 13 p0033 A77-12780
- The Stirling engine - Engineering considerations in view of future needs 13 p0041 A77-12842
- Hydrogen as a fuel in compression ignition engines 13 p0071 A77-18932
- The thermodynamic cycle of the ONERSOL engine --- solar Rankine piston engine 14 p0152 A77-21829
- The M-14P aircraft engine --- Russian book 15 p0320 A77-38300
- Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 14 p0245 A77-21647
- Emissions and total energy consumption of a multicylinder piston engine running on gasoline and a hydrogen-gasoline mixture [NASA-TN-D-8487] 15 p0353 A77-23114
- PISTON THEORY**
- Self-starting, intrinsically controlled Stirling engine 13 p0041 A77-12844
- Experimental investigation of energy conversion efficiency during the interaction of a conducting-fluid piston with a magnetic field 14 p0204 A77-29618
- PLANT ROOTS**
- Cassava fuel alcohol in Brazil 16 p0444 A77-48707
- PLANTS (BOTANY)**
- Photosynthesis as a resource for energy and materials 13 p0017 A77-12233
- An economic assessment of fuelgas from water hyacinths 15 p0314 A77-37663
- A fermentation process for converting plant materials into methane 13 p0121 A77-14583
- Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations [AD-A031163] 14 p0226 A77-19662
- Feasibility of meeting the energy needs of Army bases with self-generated fuels derived from solar energy plantations. Appendixes A, B, and C [AD-A031164] 14 p0226 A77-19663
- Technical guidelines for energy conservation [AD-A041668] 16 p0546 A77-32596
- Beneficial uses of geothermal energy description and preliminary results for phase 1 of the Raft River irrigation experiment [TREE-1048] 16 p0547 A77-32609
- PLASMA ACCELERATORS**
- Induction devices - A new type of magnetohydrodynamic converter 14 p0198 A77-28786
- Experimental study of accelerating MHD-generator jets with supersonic flow distortion 15 p0269 A77-32519
- Structure of the electric field in the near-end space of a cylindrical electrode 15 p0295 A77-35607
- Experimental research of oscillations in the discharge gap of plasma accelerator [IAF PAPER 77-104] 16 p0507 A77-51431

## PLASMA CONDUCTIVITY

- Effect of nonuniform conductivity in the boundary layer at the electrode wall on local characteristics of an MHD generator with a diagonal electrode configuration and a subsonic stream 13 p0001 A77-10423
- Study of the ionization of the additive in MHD installations 13 p0002 A77-10424
- Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility 14 p0142 A77-21257
- The influence of finite electrode segmentation on electrical performances of the Faraday HD generator 15 p0309 A77-36936
- Limiting values of the energy generated by pulsed MHD-converters 15 p0316 A77-37929
- Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators 15 p0329 A77-39555

## PLASMA CONTROL

- Current status of the magnetic fusion program 13 p0035 A77-12792
- The prospect for fusion --- controlled nuclear fusion 13 p0058 A77-16357
- Concept of a fusion burner 13 p0061 A77-17014
- Advanced fuels for inertial confinement --- in laser fusion 13 p0061 A77-17016
- A possible correlation of the neutron yield to the electromechanic work in Mather-type plasma focus devices 13 p0061 A77-17017
- World survey of major facilities in controlled fusion research --- Back 13 p0067 A77-18264
- The current state and prospects for development of controlled thermonuclear fusion 14 p0157 A77-22537
- Status and outlook of controlled nuclear fusion 14 p0163 A77-23095
- Thermonuclear fusion power 15 p0296 A77-35920
- The magnetic energy storage system used in ZT-1 --- toroidal plasma pinch experiment 15 p0299 A77-36314
- Laser fusion - Capital cost of inertial confinement 15 p0300 A77-36318
- Progress in switching technology for MTS systems --- Magnetic Energy Transfer and Storage 15 p0303 A77-36377
- Electrode phenomena in slagging MHD channels 15 p0330 A77-39561
- Nuclear fusion - Focus on Tokamak 16 p0407 A77-41645
- Neutral injection at PPPL, past and present --- in toroidal plasma devices 16 p0407 A77-41698
- Additional heating in JET --- plasma energy confinement in Joint European Tokamaks 16 p0407 A77-41718
- Studies of deuterium-fueled Tokamak reactors 16 p0435 A77-47357
- The 1976 status of the Migma program of controlled fusion 16 p0435 A77-47360
- Optimization of confinement in a toroidal plasma subject to strong radial electric fields 16 p0438 A77-47958
- Tokamak hybrid study [PPPL-1284] 15 p0358 A77-23942

## PLASMA DENSITY

- The 1976 status of the Migma program of controlled fusion 16 p0435 A77-47360
- Schlieren measurements of a high density z-pinch 13 p0060 A77-16697

## PLASMA DIAGNOSTICS

- Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility 14 p0142 A77-21257
- The Tethered Balloon Current Generator - A space shuttle-tethered satellite for plasma studies and power generation 14 p0184 A77-26200
- Boundary layer measurements of temperature and electron number density profiles in a combustion MHD generator 15 p0288 A77-33710
- Plasma luminosity fluctuations as a diagnostic tool --- for coal-fired MHD facility 15 p0328 A77-39547
- Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers 15 p0330 A77-39564
- Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821
- MHD combustor effluent chemistry measurements using Raman scattering 16 p0425 A77-44825
- Advanced fuel fusion experimentation with Migma cells II and III - Orbit diagnostics and lifetime measurements 16 p0436 A77-47362
- PLASMA DYNAMICS**
- Performance theory of diagonal conducting wall MHD generators 13 p0001 A77-10423
- Schlieren measurements of a high density z-pinch 13 p0060 A77-16697
- Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field --- for MHD generator 15 p0295 A77-35798
- Mark VI MHD generator studies 15 p0325 A77-39528
- PLASMA ELECTRODES**
- Effect of nonuniform conductivity in the boundary layer at the electrode wall on local characteristics of an MHD generator with a diagonal electrode configuration and a subsonic stream 13 p0001 A77-10423
- Boundary-layer separation from the electrode wall of an MHD generator 13 p0048 A77-13711
- A 2-MW electric arc generator with porous cooling of the interelectrode insert 13 p0049 A77-13831
- Study of cathode spots in the presence of slag films on the electrodes of an open-cycle MHD generator 13 p0053 A77-15005
- Slag interaction phenomena on MHD generator electrodes [AIAA PAPER 77-109] 14 p0135 A77-19833
- Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility 14 p0139 A77-21215
- Voltage consolidation and control circuits for multiple-electrode MHD generators 14 p0141 A77-21252
- Structure of the electric field in the near-end space of a cylindrical electrode 15 p0295 A77-35607
- Gaseous electrode development at RMC --- for plasma channel operation in MHD generators 15 p0325 A77-39530
- Design and performance of high temperature ceramic electrode modules --- in MHD generators 15 p0327 A77-39543
- The evaluation of electrode materials for slag coated MHD channels 15 p0328 A77-39545
- Electrode phenomena in slagging MHD channels 15 p0330 A77-39561
- Elimination of current concentration due to Hall effect by variable resistive electrodes 16 p0418 A77-43119
- Calculation of a three-dimensional model for a conduction MHD machine with frame-type electrodes 16 p0425 A77-44694

- Increasing the electrical strength of the interelectrode gap in an MHD generator  
16 p0428 A77-46091
- PLASMA GENERATORS**  
A 2-MW electric arc generator with porous cooling of the interelectrode insert  
13 p0049 A77-13831  
Measurement of the excess oxidant ratio in the combustion products of an MHD-generator  
14 p0136 A77-20107  
Explosively driven MHD generator power systems for pulse power applications  
15 p0299 A77-36300  
Limiting values of the energy generated by pulsed MHD-converters  
15 p0316 A77-37929  
Update on the development of 120-keV multi-megawatt neutral beam source  
15 p0335 A77-39749
- PLASMA HEATING**  
Muon catalysed fusion for pellet ignition  
13 p0012 A77-11468  
Supplementary plasma heating studies in the atomic energy commission, France  
13 p0064 A77-17819  
Lasers and controlled thermonuclear fusion. I  
14 p0135 A77-19918  
Ignition of a pulsed thermonuclear reaction by high-current ion beams  
14 p0164 A77-23106  
Minor radius compression experiments --- for ohmic heating efficiency improvement in Tokamaks  
16 p0407 A77-41683  
Neutral injection at PPPI, past and present --- in toroidal plasma devices  
16 p0407 A77-41698  
Heating of the Frascati Tokamak by means of quasi-perpendicular neutral injection  
16 p0407 A77-41706  
Additional heating and refuelling for the ASDEX divertor Tokamak  
16 p0407 A77-41710  
Plasma heating systems planned for the Argonne experimental power reactor  
16 p0407 A77-41712  
Additional heating in JET --- plasma energy confinement in Joint European Tokamaks  
16 p0407 A77-41718  
Symposium on Engineering Problems of Fusion Research, 6th, San Diego, Calif., November 18-21, 1975, Proceedings  
16 p0425 A77-44975  
Review of toroidal theta-pinch theory  
16 p0427 A77-45628  
Unified criterion for proximity to controlled fusion  
16 p0436 A77-47369  
Electron beam heated solenoid reactors for fusion power and fissile fuel breedings  
16 p0459 A77-48827  
Evaluation of the technical and economic feasibility of mirror fusion devices [UCRL-13695]  
15 p0386 A77-26977
- PLASMA JETS**  
Investigation of the Hall effect in the plasma of an inductive high-frequency discharge  
15 p0297 A77-36088  
Low arc drop hybrid mode thermionic converter  
16 p0466 A77-48890  
RF oscillations of a plasma in crossed E x H fields  
16 p0503 A77-50350  
Experimental research of oscillations in the discharge gap of plasma accelerator [IAF PAPER 77-104]  
16 p0507 A77-51431
- PLASMA LOSS**  
Influence of various losses on the characteristics of high-power MHD generators  
13 p0046 A77-13258  
Effect of various losses on the characteristics of powerful MHD generators  
15 p0263 A77-31538
- PLASMA OSCILLATIONS**  
RF oscillations of a plasma in crossed E x H fields  
16 p0503 A77-50350
- PLASMA PHYSICS**  
Explosion compression of plasma up to critical values of thermonuclear microfusion. I, II  
16 p0400 A77-41201
- A simple physical model of a magnetohydrodynamic generator  
16 p0443 A77-48570  
Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator [NASA-TN-D-8374]  
14 p0213 A77-17852
- PLASMA PINCH**  
Schlieren measurements of a high density z-pinch  
13 p0060 A77-16697  
The magnetic energy storage system used in ZT-1 --- toroidal plasma pinch experiment  
15 p0299 A77-36314
- PLASMA POTENTIALS**  
Investigation of two-dimensional electric effects in a sectional MHD-channel  
15 p0317 A77-37930
- PLASMA POWER SOURCES**  
Limiting capabilities with respect to electric power generation of a pulsed MHD generator operating at a resistive load  
13 p0064 A77-17917  
Threshold capabilities of a pulsed MHD converter for the production of electric power with a resistive load  
16 p0399 A77-40591
- PLASMA RADIATION**  
Experimental fluctuation analysis in a noble gas MHD generator  
15 p0326 A77-39535  
Plasma luminosity fluctuations as a diagnostic tool --- for coal-fired MHD facility  
15 p0328 A77-39547
- PLASMA TEMPERATURE**  
Study of the electrical characteristics of the boundary layer on the metal surfaces in the channels of an open cycle MHD generator  
13 p0054 A77-15666  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility  
14 p0142 A77-21257  
Electrode phenomena in slagging MHD channels  
15 p0330 A77-39561
- PLASMA-PARTICLE INTERACTIONS**  
Muon catalysed fusion for pellet ignition  
13 p0012 A77-11468
- PLASMA GUIDES**  
Effect of two-dimensional inhomogeneities on the properties of framed MHD channels  
16 p0428 A77-46088
- PLASMAS (PHYSICS)**  
Tokamak hybrid study [PPPL-1284]  
15 p0358 A77-23942  
Applied research in the general area of charged particle chemistry related to coal-fired MHD [PB-263873/2]  
15 p0387 A77-26987  
Superconducting magnetic energy storage [LA-UR-76-2047]  
15 p0397 A77-27933
- PLASMA TUBES**  
Status of research on advanced thermionic converters  
16 p0466 A77-48889
- PLASTIC COATINGS**  
Plastics in systems of solar technology - A survey  
14 p0197 A77-28677  
Consideration of encapsulants for photovoltaic arrays in terrestrial applications  
14 p0203 A77-29580  
Contribution to procedures for testing Silazane resin coatings --- for solar concentrators  
16 p0443 A77-48522  
Development of plastic honeycomb flat-plate solar collectors [SAN/1081-76/1]  
15 p0372 A77-25640
- PLASTICS**  
Plastics for solar-energy collectors. I - General aspects, hot-water collectors, design variants  
13 p0009 A77-11267  
Plastics for solar-energy collectors. II - Typical operational data and model parameters, functional diagrams, optimization of layer thicknesses  
13 p0009 A77-11269  
Solar-optical analyses of a mass-produced plastic circular Fresnel lens  
14 p0181 A77-25906

## SUBJECT INDEX

## POLLUTION CONTROL

- Collectors, pipelines, and heat storage units made of plastics 14 p0202 A77-29567
- Plastics in systems of solar technology 15 p0336 A77-39979
- PLATINUM**
- Optimization of PT-doped Kocite (trademark) electrodes in H3 PO4 fuel cells [AD-A025326] 13 p0107 A77-12529
- PLUMES**
- Further studies on the oxidation of sulfur dioxide in coal-fired power plant plumes 15 p0333 A77-39657
- Theoretical, numerical, and physical techniques for characterizing power plant plumes [PB-253099/6] 13 p0101 A77-11599
- Oxidation of sulfur dioxide in power plant plumes [BNL-21698] 15 p0386 A77-26713
- PLUTONIUM OXIDES**
- KIPS - Kilowatt Isotope Power System --- for use in satellites 13 p0041 A77-12837
- PLYWOOD**
- The application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine 14 p0156 A77-22142
- Application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine [SAND-75-0284] 16 p0521 A77-29612
- POINTING CONTROL SYSTEMS**
- An automatic solar disk tracking system for incident energy measurements 14 p0138 A77-20749
- Study of a heliostat system for a solar thermal converter with an energy of 10 MW 14 p0150 A77-21811
- Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297
- The advantages of sun tracking for planar silicon solar cells 14 p0181 A77-25904
- A self-contained solar powered tracking device [ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477
- On the optimum orientation of solar collectors 15 p0322 A77-38789
- POLAR REGIONS**
- Where do we locate the moon base --- considering polar regions as preferred lunar observatory sites 16 p0504 A77-51023
- Concrete placing techniques used during the construction of the kasnoyarsk hydroelectric power plant [AD-A026967] 13 p0121 A77-14528
- Polar energy resources potential [GPO-76-187] 16 p0520 A77-29605
- POLARIZATION (CHARGE SEPARATION)**
- Molten carbonate fuel cell model 16 p0447 A77-48737
- POLARIZATION CHARACTERISTICS**
- Air electrodes for H2-air fuel cells with alkali electrolyte 13 p0065 A77-18196
- POLICIES**
- Legal and public policy setting for geothermal resource development in Hawaii [PB-262910/3] 15 p0343 A77-22596
- POLLUTION CONTROL**
- The fuel approach to control emissions from aircraft [IAF PAPER 76-111] 13 p0003 A77-10911
- Controlled tipping of combustion residues 13 p0008 A77-11175
- Low-sulfur coal obtained by chemical desulfurization followed by liquefaction 13 p0008 A77-11242
- Air cleanup and energy management 13 p0010 A77-11302
- Clean air protection and industrial development 13 p0010 A77-11303
- The conservation of air purity and its effect on the energy economy 13 p0049 A77-13811
- Alternate fuels for road vehicles of the future 13 p0051 A77-14584
- Wide-range control of a thermal interconnection network --- waste incineration utilization supplying pipelined steam heat 14 p0145 A77-21545
- United States Postal Service Electric Vehicle Program 14 p0161 A77-22912
- Reduction of atmospheric pollution due to the automobile and energy savings 14 p0162 A77-22948
- Combustion of pulverized, solvent-refined coal [ASME PAPER 76-WA/FU-6] 14 p0185 A77-26456
- Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors [ASME PAPER 76-WA/FU-10] 14 p0185 A77-26457
- SO2 control technologies - Commercial availabilities and economics 14 p0191 A77-27279
- Environmental aspects of coal conversion plant siting and cost of pollution control 14 p0192 A77-27293
- Report on Joint Conference Eno Foundation Board of Directors and Board of Consultants, October 13 and 14, 1976 15 p0260 A77-31064
- Whatever happened to the Wankel engine 15 p0272 A77-33125
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392
- Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396
- A hydrogen-powered mass transit system 15 p0282 A77-33400
- Use of hydrogen in automotive engines 15 p0283 A77-33401
- Emissions from compressor stations --- noise pollution 15 p0287 A77-33545
- Automotive sulfate emissions 15 p0290 A77-34629
- State of the art of particulate and SO2 removal on coal fired boilers 15 p0293 A77-35167
- Synthetic additives for SO2 removal from combustion gas in a fluidized-bed coal combustor 15 p0293 A77-35168
- A method for evaluating SO2 abatement strategies 15 p0293 A77-35169
- Chemical reduction of SO3, particulates and NOx emissions 15 p0294 A77-35188
- A multigas analyzer for automobile exhausts 15 p0297 A77-36026
- Operation results of the desulfurization plant for a thermal power station 15 p0299 A77-36279
- Stack gas cleanup --- scrubber systems for high-sulfur coal 15 p0317 A77-37939
- An application of the economic-environmental power dispatch --- decision approach for controlling air pollution emission from electric power generation 15 p0317 A77-38121
- Progress on the selective removal of H2S from gasified coal using an immobilized liquid membrane 15 p0318 A77-38146
- Optimization of automotive engine fuel economy and emissions 15 p0320 A77-38373
- Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79] 15 p0321 A77-38533
- Can we control the carbon dioxide in the atmosphere 15 p0322 A77-38674
- Economic and energy considerations in HHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
- The oxidant formation potential of emissions from catalyst-equipped vehicles 15 p0333 A77-39596
- Strategy of pollution control --- Book 16 p0400 A77-40673

- New developments on VW-PCI and VW-PCV stratified charge engine concepts --- Pre-Chamber-Injection and Pre-Chamber-Valve combustion processes  
16 p0401 A77-41257
- Utility views of MHD power generation [AIAA 77-1010]  
16 p0403 A77-41557
- Energy reduction in cleaning exhausts containing particulates and noxious gases  
16 p0414 A77-42740
- Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif., May 12, 13, 1976, Proceedings  
16 p0415 A77-42854
- Control of air pollution sources --- Book  
16 p0419 A77-43522
- Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants  
16 p0420 A77-44178
- Northeastern utilities are meeting the clean air challenge  
16 p0424 A77-44612
- Being prepared for future Argo Merchants --- tanker oil spill prevention  
16 p0425 A77-45228
- Combustion technology for the improvement of engine efficiency and emission characteristics  
16 p0440 A77-48172
- Improved systems for energy conversion and conservation as pollution control alternatives - USEPA program  
16 p0451 A77-48771
- Pollution control in geothermal energy  
16 p0452 A77-48772
- Impact of air quality regulation on the electric power industry  
16 p0452 A77-48775
- Power generation: Air pollution monitoring and control --- Book  
16 p0504 A77-51126
- Eliminate source emission codes for coal-fired power plants  
16 p0504 A77-51128
- Status of sulfur dioxide removal systems for the electric utility industry  
16 p0504 A77-51144
- Flue gas desulfurization by fly ash  
16 p0504 A77-51146
- Electrostatic precipitator design for western coals  
16 p0504 A77-51148
- Air pollution control for industrial coal-fired boilers  
16 p0504 A77-51152
- Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite  
16 p0508 A77-51587
- A 1977 approach to sulfur oxide emissions [ASME PAPER 77-JPGC-PWR-1]  
16 p0508 A77-51621
- The proceedings of the NOx Control Technology Seminar  
[PB-253661/3] 13 p0092 A77-10707
- Cost analysis of two air quality attainment strategies  
[PB-254182/9] 13 p0092 A77-10719
- Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization  
[PB-254166/2] 13 p0101 A77-11581
- The air quality and economic implications of supplementary control systems in Illinois --- considering electric power plant fuels  
[PB-255699/1] 13 p0101 A77-11588
- Investigation and assessment of light-duty-vehicle evaporative emission sources and control  
[PB-255813/8] 13 p0102 A77-11603
- Proceedings of the Stationary Source Combustion Symposium. Volume 1. Fundamental research  
[PB-256320/3] 13 p0116 A77-13569
- Proceedings of the Stationary Source Combustion Symposium. Volume 2. Fuels and process research and development  
[PB-256321/1] 13 p0116 A77-13570
- Evaluation of pollution control in fossil fuel conversion processes  
[PB-255842/7] 13 p0125 A77-14638
- Hot fuel gas desulfurization  
[PB-257036/4] 13 p0133 A77-15539
- Performance of emission control devices on boilers firing municipal solid waste and oil  
[PB-257136/2] 13 p0133 A77-15550
- Control of waste and water pollution from power plant flue gas cleaning systems  
[PB-259211/1] 14 p0227 A77-19953
- Technology and economics of flue gas NOx oxidation by ozone  
[PB-261917/9] 15 p0350 A77-22700
- Combustion additives for pollution control: A state-of-the-art review  
[PB-264068/8] 15 p0359 A77-24316
- Effect of automotive parts on vehicle and engine emissions. Phase 1: Original equipment  
[PB-264057/1] 15 p0368 A77-24672
- Survey of emissions control and combustion equipment data in industrial process heating  
[PB-263453/3] 15 p0368 A77-24674
- Energy requirements for air pollution control in the primary aluminum industry  
[PB-264483/9] 15 p0375 A77-25684
- Measurement of dry deposition of fossil fuel plant pollutants  
[PB-264495/3] 15 p0376 A77-25685
- Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164] 15 p0383 A77-26675
- Report of the Hearing Panel: National Public hearing on Power Plant Compliance with Sulfur Oxide Air Pollution Regulations  
[PB-264891/3] 15 p0396 A77-27625
- Environmental effects of energy production and utilization in the US. Volume 1: Sources, trends and costs of control  
[UCRL-51930-VOL-1] 16 p0530 A77-30645
- Dimensions. Volume 61, number 3 --- with emphasis on air pollution control  
[PB-266997/6] 16 p0531 A77-31019
- Automobile emission control: Technological approaches toward improving in-use vehicle emissions performance  
[PB-267537/9] 16 p0544 A77-32508
- Study of gasoline vapor emission controls at small bulk plants  
[PB-267096/6] 16 p0549 A77-32638
- The biodegradation of oil in sea water for naval pollution control  
[AD-A042375] 16 p0560 A77-33688
- POLLUTION MONITORING**
- Evolution of atmospheric pollution /high acidity and black fumes/ in France during 1975  
13 p0002 A77-10670
- Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer  
13 p0062 A77-17541
- Tracking pollutants from a distance  
13 p0067 A77-18370
- Organization of long range transport of air pollution monitoring in Europe  
13 p0071 A77-18754
- The role of gas utilization in environmental protection  
15 p0265 A77-31849
- Particle size distributions of dusts in the flue gas of power plants and in atmospheric air  
15 p0265 A77-31889
- Distribution of some hydrocarbons in ambient air near Delft and the influence on the formation of secondary air pollutants  
15 p0271 A77-32954
- Determination of SO2 concentrations from a coal-burning power plant stack by Fourier spectrometry  
15 p0296 A77-36024
- Dynamic characteristics of the desulfurization plant boiler draft system for power stations  
15 p0338 A77-40201
- Use of a carbon dioxide laser in remote detection of petroleum oil pollution at sea  
16 p0433 A77-47080
- Power generation: Air pollution monitoring and control --- Book  
16 p0504 A77-51126
- Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station  
16 p0504 A77-51135

- Advanced coal gasification system for electric power generation --- pollution monitoring [PB-1514-176] 13 p0088 N77-10653
- Methods in environmental sampling for radionuclides [OCRL-77722] 13 p0C91 N77-10697
- Compilation of air pollutant emission factors. Supplement [PB-254274/4] 13 p0093 N77-10731
- Development of fuel cell CO detection instruments for use in a mine atmosphere [PB-254823/8] 13 p0095 N77-11380
- Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges [PB-256691/7] 13 p0133 N77-15540
- Environmental protection measuring technique. Sensor for automatic continuous emission control of gases [BNFT-PE-T-76-03] 14 p0209 N77-16467
- Initial environmental test plan for source assessment of coal gasification [PB-261516/1] 15 p0350 N77-22705
- Development of procedures for the measurement of fugitive emissions [PB-263992/0] 15 p0368 N77-24671
- Coal gasification study [AD-A041860] 16 p0554 N77-33615
- POLONIUM**
- Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer [BLL-SMRE-TRANS-6562-(8313.4)] 15 p0371 N77-25485
- POLYCRYSTALS**
- Deposition of polycrystalline silicon solar cells 13 p0C76 A77-19082
- Reduction of grain boundary recombination in polycrystalline silicon solar cells 14 p0181 A77-25999
- Photoelectrochemical energy conversion and storage - The polycrystalline CdSe cell with different storage modes 14 p0196 A77-28463
- Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723
- Low-cost solar cells based on large-area unconventional silicon 15 p0258 A77-30730
- Cast polycrystalline silicon Schottky-barrier solar cells 16 p0503 A77-50295
- POLYETHYLENES**
- Solar water heater using hardened black polythene pipe absorbers 13 p0073 A77-19060
- POLYMER CHEMISTRY**
- Solid Polymer Electrolyte (SPE) fuel cell technology, program review, phase 2 [NASA-CR-150957] 13 p0097 N77-11532
- POLYMERIC FILMS**
- Plastics for solar-energy collectors. II - Typical operational data and model parameters, functional diagrams, optimization of layer thicknesses 13 p0009 A77-11269
- Radiant transmittance of V-corrugated transparent sheets with application to solar collectors [ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506
- Thin films in energy systems --- for energy conserving structural materials 15 p0306 A77-36673
- Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators 15 p0316 A77-37767
- Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators 16 p0437 A77-47423
- POLYMERS**
- Concrete-polymer materials for geothermal applications [BNL-20665] 15 p0340 N77-22263
- Oil and fat absorbing polymers [NASA-CASE-MPO-11609-2] 16 p0532 N77-31308
- Solid polymer electrolyte (SPE) fuel cell technology program, phase 1/1A --- design and fabrication [NASA-CR-151506] 16 p0553 N77-33605
- Solid polymer electrolyte (SPE) fuel cell technology program, phase 2/2A --- testing and evaluations [NASA-CR-151507] 16 p0553 N77-33606
- POLYMETHYL METHACRYLATE**
- Studies into reduction of radiative heat losses of flat plate solar collectors 16 p0417 A77-42962
- POLYTETRAFLUOROETHYLENE**
- Studies into reduction of radiative heat losses of flat plate solar collectors 16 p0417 A77-42962
- POLYURETHANE FOAM**
- Manufacture of plastic foam concentrators and their characteristics 14 p0154 A77-21852
- Fabrication of solar energy concentrators based on polyurethane foams using new polyol and isocyanate compounds 15 p0271 A77-32973
- Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators 15 p0316 A77-37767
- Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators 16 p0437 A77-47423
- Experimental polyurethane foam roofing systems [AD-A031046] 14 p0210 N77-17255
- POROUSITY**
- Mathematical modelling of single-phase nonisothermal fluid flow through porous media [PB-262884/0] 15 p0362 N77-24577
- POROUS MATERIALS**
- A comparison of porous silver catalysts in oxygen electrodes of alkaline fuel cells 13 p0067 A77-18350
- Desulfurization of flue gases with iron/III/ oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions --- German book 13 p0080 A77-19184
- Free thermal convection in geothermal fields - Physical understanding and mathematical modeling 14 p0174 A77-24204
- Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells 16 p0420 A77-44059
- Porous electrodes for Zn/air alkaline battery 16 p0431 A77-46722
- Similarity solutions for mixed convection from horizontal impermeable surfaces in saturated porous media [PB-261561/5] 15 p0342 N77-22432
- The influence of lateral mass efflux on free convection boundary layers in a saturated porous medium [PB-261558/1] 15 p0342 N77-22587
- POROUS PLATES**
- Thermal convection of water in a porous medium - Effects of temperature- and pressure-dependent thermodynamic and transport properties --- for non-Boussinesq geothermal layers 14 p0145 A77-21546
- POROUS WALLS**
- A 2-MW electric arc generator with porous cooling of the interelectrode insert 13 p0049 A77-13831
- PORTABLE EQUIPMENT**
- Conference on Portable Power Sources in India, 1st, Calcutta, India, May 27, 28, 1976, Proceedings 16 p0420 A77-44052
- POSITION (LOCATION)**
- Site energy handbook. Volume 2: Forms for energy survey and appraisal [ERDA-76-131/2] 15 p0355 N77-23608
- POSITION ERRORS**
- Design of a tracking system for a solar-energy installation 13 p0015 A77-11919
- POSTFLIGHT ANALYSIS**
- Concorde - Endurance flights results 13 p0016 A77-12114

## POTASSIUM

- Recent experimental studies of the interaction of potassium seed with coal slag in a direct-coal fired MHD generator 14 p0141 A77-21250
- Electrical conductivity of molten coal slags containing potassium seed 15 p0330 A77-39565
- Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system 15 p0331 A77-39570

## POTASSIUM ALLOYS

- Experimental two-phase liquid-metal magnetohydrodynamic generator program [AD-A035245] 15 p0367 N77-26988

## POTASSIUM COMPOUNDS

- Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251
- Evaluation of potassium titanate as a component of alkaline fuel cell matrices [NASA-TN-D-8341] 13 p0094 N77-11175

## POTASSIUM HYDROXIDES

- Solution of silica in Green River oil shale 14 p0169 A77-23558

## POTENTIAL ENERGY

- Storage of solar energy in the form of potential hydraulic energy 13 p0075 A77-19078
- Geothermal development and the Salton Sea 14 p0194 A77-27352
- Wave power --- potentially available in New Zealand 16 p0418 A77-43011

## POTENTIAL FLOW

- Potential aerodynamic analysis of horizontal-axis windmills [AIAA PAPER 77-132] 14 p0135 A77-19848

## POWDER (PARTICLES)

- Modelling of entrained-bed pulverized coal gasifiers 16 p0401 A77-41321

## POWDER METALLURGY

- Porous electrodes for Zn/air alkaline battery 16 p0431 A77-46722

## POWER CONDITIONING

- Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563
- Power deposition in He from the volumetric He-3/n,p/H-3 reaction --- for direct nuclear pumped lasers 16 p0426 A77-45307

- The electrical power system for Spacelab 16 p0432 A77-46789
- Aircraft power supplies and cooling problems: A viewpoint from the power conditioner designer 14 p0207 N77-16039

- High power study - power conditioning --- for magnetohydrodynamic generators and turbine driven alternators [AD-A038724] 16 p0522 N77-29625

## POWER EFFICIENCY

- Optimization of current source operation in pulse mode --- for electrochemical generators [IAF PAPER 76-255] 13 p0003 A77-10952
- Selection of driving cycles for electric vehicles of the 1990's 13 p0024 A77-12702

- Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708

- Dependability of wind energy generators with short-term energy storage 13 p0046 A77-13323

- Electric load management and energy conservation 14 p0137 A77-20685

- Problems of analysis of the power characteristic of a high capacity magnetohydrodynamic power station 14 p0143 A77-21270

- 100 kilowatt-hours per day with RTC silicon solar cells 14 p0153 A77-21835

- Potentialities of electric energy production by means of thermoelectric generators 14 p0154 A77-21847

- 100 MW large industrial gas turbine 14 p0155 A77-22022

- On-the-road evaluation of the efficiency of propulsion system of city vans 14 p0160 A77-22888

- The nickel-zinc battery - A viable alternative for vehicle powering 14 p0160 A77-22894

- Allocation of standby power units in terms of the output power, in planning the development of power systems 14 p0167 A77-23406

- New requirements for the development and design of thermal power systems 14 p0167 A77-23407

- Flap-augmented shrouds for aerogenerators 14 p0183 A77-26085

- Analysis of the wind-driven reciprocator 14 p0183 A77-26088

- Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling [ASME PAPER 77-GT-2] 14 p0197 A77-28522

- A development of high efficiency electric mini-cars 14 p0201 A77-29470

- Electric power fluctuations in a MHD generator 15 p0269 A77-32432

- High-efficiency and high-peak-power InP transferred-electron oscillators 15 p0289 A77-34366

- The spacing of wind turbines in large arrays 16 p0416 A77-42893

- Flywheel hybrid power trains. I - Component and drive selection. II - Numerical optimization and operation 16 p0438 A77-47968

- Increased central station power plant efficiency with a thermionic topping system 16 p0467 A77-48894

- Array power output of non-identical electrical cells 16 p0468 A77-48903

- Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units 13 p0096 N77-11525

- An estimate of the interaction of a limited array of windmills --- feasibility of windpower group station for proposed site [DM-16] 13 p0114 N77-13539

- Summary report of three powerplant productivity studies [PB-257764/1] 14 p0212 N77-17598

- Solar array maximum power tracking with closed-loop control of a 30-centimeter ion thruster [NASA-TN-X-73643] 15 p0376 N77-26222

## POWER LINES

- Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet 14 p0144 A77-21391

- Experimental study of several modes of operation of a laboratory section of a three-phase superconducting power transmission cable 16 p0438 A77-47753

- Non-nuclear energy technology. Low temperature cable for power transmission [BNFT-PB-T-76-01] 14 p0210 N77-17372

- Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet [LA-UR-76-1809] 14 p0235 N77-21325

- Brookhaven superconducting cable test facility [BNL-21780] 14 p0236 N77-21331

- Cryogenic power transmission technology: Cryogenic dielectrics [ORNL-TN-5608] 15 p0389 N77-27249

## POWER PLANTS

- Evolution of atmospheric pollution /high acidity and black fumes/ in France during 1975 13 p0002 A77-10670

- Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis 13 p0029 A77-12745

- Direct contact heat exchangers for geothermal power plants 13 p0029 A77-12747

- Aerothemic power plant with artificial cyclone 13 p0077 A77-19098



- Problems of transportation power plants  
14 p0136 A77-20004
- Influence of coal type and drying upon MHD power plants and components  
14 p0140 A77-21231
- Development of a baseline reference design for an open cycle MHD power plant for commercial service  
14 p0140 A77-21232
- Model formulations for development planning of energy systems  
14 p0191 A77-27036
- Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility  
15 p0271 A77-32800
- Mercury emissions from geothermal power plants  
15 p0289 A77-34428
- Factors influencing the economics of large-scale in situ coal gasification operations  
15 p0306 A77-36765
- Environmental aspects of low Btu gas combustion --- nitrogen oxide emissions from power plants  
16 p0440 A77-48178
- A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants  
16 p0452 A77-48779
- An environmental assessment of a 638 MWe molten carbonate fuel cell power plant  
16 p0453 A77-48781
- Coal fired combined cycle for electric power generation  
16 p0453 A77-48783
- Fluidized bed adiabatic combustor power plants - Concepts and comparisons  
16 p0453 A77-48784
- Multiparameter optimization studies on geothermal energy cycles  
16 p0456 A77-48804
- Effect of reservoir temperature decline on geothermal power plant design and economics  
16 p0456 A77-48805
- The helical screw expander evaluation project --- for geothermal wells  
16 p0456 A77-48809
- Comparative assessment of orbital and terrestrial central power plants  
16 p0465 A77-48878
- Comparative evaluation of technical and economic indices for MHD and thermonuclear reactors for steam turbine facilities  
16 p0469 A77-48909
- Collector field design for a central receiver solar thermal power plant  
16 p0484 A77-49039
- Studies of biofouling in ocean thermal energy conversion plants  
16 p0484 A77-49044
- Summary description of the BOOM1 model --- simulating power plant impact on isolated communities [LA-6424-MS]  
15 p0369 A77-25010
- Comparison of calculated and measured maximum aboveground air pollutant concentrations and their respective distances from the source of release of large power plants [ORNL-TR-4231]  
15 p0386 A77-26712
- Internalizing social costs in power plant siting: Some examples for coal and nuclear plants in the United States [CONF-761103-16]  
15 p0386 A77-26816
- POWER REACTORS**  
Review of the conceptual design of a doublet fusion experimental power reactor [ASME PAPER 76-WA/NE-9]  
14 p0188 A77-26494
- Plasma heating systems planned for the Argonne experimental power reactor  
16 p0407 A77-41712
- Applications of superconducting magnets to energy with particular emphasis on fusion power  
16 p0411 A77-42161
- Field-reversed mirror as a D-T power reactor [UCRL-78082]  
15 p0351 A77-22967
- POWER SUPPLIES**  
Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units  
13 p0096 A77-11525
- Laboratory evaluation of solar power units for marine aids to navigation [AD-A034987]  
15 p0375 A77-25672
- POWER TRANSMISSION**  
Thermoelectronic laser energy conversion for power transmission in space  
16 p0464 A77-48876
- PRECIPITATION**  
Precipitation and scaling in dynamic geothermal systems [ORNL-TR-5649]  
14 p0249 A77-21680
- PRECIPITATION (CHEMISTRY)**  
Study of silica scaling from geothermal brines [PB-262890/7]  
15 p0357 A77-23626
- PRECIPITATION (METEOROLOGY)**  
Organization of long range transport of air pollution monitoring in Europe  
13 p0071 A77-18754
- Precipitation scavenging of fossil-fuel effluents [PB-256649/5]  
13 p0124 A77-14630
- PREDICTION ANALYSIS TECHNIQUES**  
A methodological survey of energy modeling  
14 p0177 A77-24592
- Development of cumulative noise measure for the prediction of general annoyance in an average population  
15 p0320 A77-38497
- Energy forecasts yesterday and today  
16 p0400 A77-40683
- Analysis of information systems for hydropower operations [NASA-CR-149373]  
13 p0129 A77-15497
- Comparison of computer-predicted and observed energy uses in a multi-family high-rise apartment building [PB-267829/0]  
16 p0539 A77-31665
- Numerical solution of heat conduction with phase change in cylindrical systems  
16 p0543 A77-32422
- Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045]  
16 p0546 A77-32593
- PRESIDENTIAL REPORTS**  
The President's energy program [GPO-88-556]  
16 p0552 A77-33599
- PRESSURE DISTRIBUTION**  
Pressure ratio optimization criteria in aircraft turbojet-engines design  
13 p0062 A77-17258
- Experimental study of accelerating MHD-generator jets with supersonic flow distortion  
15 p0269 A77-32519
- Water electrolysis under pressure: Improvement of energy efficiency by temperature increase  
14 p0238 A77-21594
- PRESSURE DROP**  
A new mathematical model for Stirling cycle machines  
16 p0465 A77-48884
- PRESSURE EFFECTS**  
The Osmotic power plant  
13 p0021 A77-12668
- Current status of the BI-GAS process  
14 p0193 A77-27300
- Electric power fluctuations in a MHD generator  
15 p0269 A77-32432
- Fundamentals of coal gasification  
15 p0308 A77-36809
- On pressure-work, viscous dissipation and the energy balance relation for geothermal reservoirs  
16 p0505 A77-51256
- PRESSURE GRADIENTS**  
The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements  
13 p0028 A77-12735
- PRESSURE MEASUREMENTS**  
The status of instrumentation and process control techniques for in situ coal gasification  
14 p0191 A77-26790
- PRESSURE OSCILLATIONS**  
An experimental investigation of fluctuating properties within a combustion MHD generator  
15 p0330 A77-39559
- PRESSURE VESSEL DESIGN**  
Automotive hydride tank design  
15 p0282 A77-33399

## PRESSURE VESSELS

A pressurized liquid concept for solar-thermal energy storage for the 24-hour continuous operation of an energy conversion system [ASME PAPER 76-WA/HT-38] 14 p0187 A77-26484  
Selection of structural materials for hydrogen pipelines and storage vessels 15 p0281 A77-33390

Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks 14 p0239 A77-21599

## PRESSURIZING

Preliminary analysis of electric generation utilizing geopressured geothermal fluids 13 p0030 A77-12752  
Pressurized fluidized-bed coal combustion 16 p0454 A77-48788

## PRIMARY BATTERIES

Power Sources Symposium, 27th, Atlantic City, N.J., June 21-24, 1976, Proceedings 14 p0195 A77-28126

## PRINTED CIRCUITS

Encapsulation of solar cell modules 13 p0076 A77-19092

## PRISMS

Transmission solar focusing collector 15 p0334 A77-39671  
Study of the feasibility of exploiting the galloping phenomenon as energy source 16 p0407 A77-41722  
Prisms with total internal reflection as solar reflectors 16 p0488 A77-49071  
Prisms with total internal reflection as solar reflectors [ANL-SOL-76-04] 15 p0345 A77-22629

## PROBABILITY DISTRIBUTION FUNCTIONS

Composition method for constructing guaranteed-output curves of solar- and wind-power plants utilized jointly 14 p0201 A77-29534  
A method for evaluating SO<sub>2</sub> abatement strategies 15 p0293 A77-35169

## PROCEEDINGS

Proceedings of the ERDA Semiannual Solar photovoltaic Program Review Meeting [CONF-760837-P2] 16 p0555 A77-33628

## PRODUCT DEVELOPMENT

The quality category in solar engineering 14 p0143 A77-21310  
Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays [NASA-CR-149451] 13 p0106 A77-12524  
Heat pipe and space radiator developments 13 p0120 A77-14391  
Sodium chloride battery development program for load leveling [PB-257570/2] 14 p0208 A77-16456  
Fuel cell stacks [AD-A030375] 14 p0213 A77-17603  
A study of geothermal prospects in the western United States [NASA-CR-149812] 14 p0220 A77-19575  
Central receiver solar thermal power system, collector subsystem [SAN/1111-75/1] 14 p0230 A77-20576

## PRODUCTION

Solar silicon via improved and expanded metallurgical silicon technology [NASA-CR-153415] 16 p0528 A77-30606

## PRODUCTION ENGINEERING

A sulfuration process for the preparation of photovoltaic Cu<sub>x</sub>S and CuInS<sub>2</sub> thin films 13 p0076 A77-19087  
Meeting electric power needs with photovoltaic power systems 13 p0076 A77-19091  
Materials and processing approaches to cost competitive wind turbine rotor blades 14 p0157 A77-22144  
Advanced technologies for photovoltaic cell fabrication 14 p0165 A77-23300  
Advanced silicon solar cell production technology [AIAA PAPER 77-485] 14 p0172 A77-23905

## Solar thermal electric power systems -

Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474  
Balance and optimization procedure for thermochemical cycles for hydrogen production 15 p0276 A77-33345

Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353

The production of shale oil crude and its refining into military operational fuels 15 p0292 A77-35155

Materials consideration for the Bigas coal gasification pilot plant [ASME PAPER 76-PVP-41] 15 p0323 A77-38825  
Preliminary research on Ocean Energy Industrial Complexes 16 p0484 A77-49042

Low energy production processes in manufacturing of silicon solar cells 16 p0486 A77-49055

Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 A77-10638

Prospects for hydrogen production by water electrolysis to be competitive with conventional methods [BNL-20877] 13 p0087 A77-10648

The production and refining of crude oil into military fuels [AD-A024652] 13 p0095 A77-11207

Industrial development of silicon solar cells [NASA-TT-R-17139] 13 p0097 A77-11528

Net energy analysis: An energy balance study of fossil fuel resources. Summary report [PB-259159/2] 14 p0225 A77-19658

Economic feasibility: Fuel grade methanol from coal [TID-27156] 15 p0345 A77-22630

Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels [BLL-M-25473-(5828.4F)] 15 p0359 A77-24245

The gas supplies of interstate natural gas pipeline companies, 1975 [PB-263598/5] 15 p0360 A77-24320

A framework for assessing environmental impacts of possible Antarctic mineral development, part 1 [PB-262750/3] 15 p0368 A77-24709

Research and development of low cost processes for integrated solar arrays [COO-2721-76-1] 15 p0383 A77-26670

Techniques for the analysis of total energy and labor of industrial plants [PB-264221/3] 15 p0385 A77-26697

Automated array assembly task, phase 1 [NASA-CR-153909] 15 p0391 A77-27505

Characterization of substances in products effluents and wastes from synthetic fuel production tests [BNWL-2131] 16 p0540 A77-31675

Investigation of test methods, material properties and processes for solar cell encapsulants [NASA-CR-155158] 16 p0550 A77-33347

## PRODUCTION MANAGEMENT

Evolution of the concept of the automobile from the standpoint of saving energy 13 p0051 A77-14562

Weekly petroleum statistics reports, 1974-1975 [PB-255920/1] 13 p0124 A77-14608

## PRODUCTION PLANNING

A review of the solar array manufacturing industry costing standards [NASA-CR-153401] 16 p0528 A77-30608

## PROJECT MANAGEMENT

Fossil energy research and development in ERDA 13 p0063 A77-17551

The economic viability of pursuing a space power system concept [AIAA PAPER 77-353] 13 p0066 A77-18258

Program definition for the development of geothermal energy. Volume 3: Appendixes [NASA-CR-153223] 15 p0371 A77-25614

Project Independence Evaluation System (PIES) documentation. Volume 6: Methodology for improving the price sensitivity of the PIES oil and gas supply curves [PB-264069/6] 16 p0516 A77-28606

# SUBJECT INDEX

# PROPULSION SYSTEM PERFORMANCE

- Project Independence Evaluation System (PIES) documentation. Volume 9: Allocation of exploratory activity to oil and natural gas in the PEA oil and gas supply model [PB-265772/4] 16 p0519 N77-29325
- Project Independence Evaluation System (PIES) documentation. Volume 13: Coal and electric utility conventions for PIES [PB-265824/3] 16 p0519 N77-29326
- Project Independence Evaluation System (PIES) documentation. Volume 2: PIES econometric demand model [PB-265822/7] 16 p0519 N77-29327
- Interagency energy/environment research and development program: Status report 3 [PB-267443/0] 16 p0558 N77-33662
- PROJECT PLANNING**
- Risk management of liquefied natural gas installations 13 p0002 A77-10451
- Off-shore oil scenarios - Method and results 13 p0018 A77-12282
- Largest ever liquefaction plant will test H-coal process 14 p0184 A77-26289
- Model formulations for development planning of energy systems 14 p0191 A77-27036
- Energy: The policy planning framework in state governments. Volume 1: Summary report [PB-254466/6] 13 p0089 N77-10665
- Energy: The policy planning framework in state governments. Volume 2: Appendices [PB-254467/4] 13 p0089 N77-10666
- Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576
- National plan for energy research, development and demonstration: Creating energy choices for the future. Volume 2: Program implementation --- fossil fuels, solar energy, and geothermal energy [ERDA-76-1-VOL-2] 14 p0222 N77-19600
- Program definition for the development of geothermal energy. Volume 1: Background and program definition summary [NASA-CR-153221] 15 p0371 N77-25612
- Program definition for the development of geothermal energy. Volume 2: Program definition development rationale and subprogram descriptions [NASA-CR-153222] 15 p0371 N77-25613
- Management plan for enhanced oil recovery. Volume 1: Program strategy [ERDA-77-15/1-VOL-1] 16 p0536 N77-31629
- National energy projections and plans of the USA [IAEA-CN-36/397] 16 p0548 N77-32619
- JET project (design proposal) --- Tokamak experiment [EUR-5516] 16 p0549 N77-32914
- Program plan for ERDA's participation in the IEA working party on energy conservation research and development [ERDA-77-57] 16 p0557 N77-33648
- Planning and design of additional East Mesa Geothermal Test Facilities. Phase 1B, Volume 2: Procurement package [SAM/1140-1/2-VOL-2] 16 p0558 N77-33657
- PROPANE**
- Fluidisation and gas combustion in a rotating fluidised bed 15 p0264 A77-31674
- Sensitivity analysis for OTEC propane and mixture cycles --- Ocean Thermal Energy Conversion 16 p0485 A77-49047
- Petroleum market shares. Report on sales of propane to ultimate consumers, 1975 [PB-255624/9] 13 p0108 N77-12540
- PROPELLANT ADDITIVES**
- Protocol to characterize gaseous emissions as a function of fuel and additive composition [PB-253363/6] 13 p0084 N77-10221
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 14 p0243 N77-21629
- Combustion additives for pollution control: A state-of-the-art review [PB-264068/8] 15 p0359 N77-24316
- PROPELLANT GRAINS**
- System study of fuels from grains and grasses [DSE/3729-1] 16 p0519 N77-29318
- PROPELLANT STORAGE**
- Hydrogen vehicular fuel storage as a step in a water splitting cycle 15 p0280 A77-33381
- Hydrogen-powered highway vehicles - Applications and optimum form of fuel storage 15 p0280 A77-33382
- A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve [PB-255948/2] 13 p0105 N77-12500
- PROPELLANT TESTS**
- Liquid hydrogen as propellant for commercial aircraft [DGLR PAPER 76-188] 13 p0059 A77-16534
- PROPELLER BLADES**
- The propulsion system of the aircraft Z-37. I 14 p0156 A77-22121
- PROPELLER DRIVE**
- Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft [SAB PAPER 770470] 15 p0310 A77-37088
- PROPELLER FANS**
- Energy consumption characteristics of transports using the prop-fan concept [NASA-CR-137937] 13 p0118 N77-14029
- Energy consumption characteristics of transports using the prop-fan concept: Summary report [NASA-CR-137938] 13 p0118 N77-14030
- PROPELLERS**
- A new series of aerofoil sections suitable for aircraft propellers 15 p0298 A77-36157
- Energy consumption characteristics of transports using the prop-fan concept [NASA-CR-137937] 13 p0118 N77-14029
- Energy consumption characteristics of transports using the prop-fan concept: Summary report [NASA-CR-137938] 13 p0118 N77-14030
- PROPULSION SYSTEM CONFIGURATIONS**
- Ultralightweight solar array for Naval Sea Control Systems 13 p0040 A77-12828
- Pressure ratio optimization criteria in aircraft turbojet-engines design 13 p0062 A77-17258
- Variable geometry for high performance aircraft engines 13 p0062 A77-17264
- The propulsion system of the aircraft Z-37. I 14 p0156 A77-22121
- An engine designer's view for advanced secondary power systems [AIAA PAPER 77-517] 14 p0174 A77-23931
- Future propulsion plants. I 15 p0268 A77-32251
- Advanced supersonic transport propulsion requirements [AIAA PAPER 77-831] 16 p0410 A77-41969
- Extraterrestrial resources and astronautics --- Russian book 16 p0499 A77-49400
- Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies [AD-A034995] 15 p0377 N77-26491
- PROPULSION SYSTEM PERFORMANCE**
- Laser propulsion --- rocket heat engine design [IAF PAPER 76-166] 13 p0003 A77-10931
- Electric vehicle batteries - Opportunities for materials improvement 13 p0049 A77-13736
- Fuel consumption of civil jet transport aircraft 13 p0062 A77-17234
- Technical highlights in general aviation [AIAA PAPER 77-312] 13 p0066 A77-18237
- Superconducting machinery for Naval ship propulsion 14 p0144 A77-21361
- Hybrid propulsion systems for electric road vehicles for short range public passenger transport test and operational experience - Prospects 14 p0159 A77-22881
- Influence of the intended use of an aircraft on the optimal parameters of gas-turbine power plants 15 p0266 A77-32086

# PROPULSIVE EFFICIENCY

# SUBJECT INDEX

Electrochemical energy conversion. I - Electric vehicle propulsion 15 p0303 A77-36410

The military utility of very large airplanes and alternative fuels 16 p0434 A77-47271

System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications 16 p0445 A77-48718

New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 14 p0243 A77-21629

Development of a liquid hydrogen car 14 p0244 A77-21632

Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 A77-26134

**PROPULSIVE EFFICIENCY**

Pressure ratio optimization criteria in aircraft turbojet-engines design 13 p0062 A77-17258

On-the-road evaluation of the efficiency of propulsion system of city vans 14 p0160 A77-22888

Energy utilization factor in civil transport aircraft 15 p0307 A77-36788

Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft [SAE PAPER 770470] 15 p0310 A77-37088

High efficiency engine cycles for air transport fuel economy 15 p0339 A77-22126

**PROTECTIVE COATINGS**

Corrosion problems related to the employment of aluminum in collector construction 14 p0202 A77-29566

Contribution to procedures for testing Silazan resin coatings --- for solar concentrators 16 p0443 A77-48522

Experimental polyurethane foam roofing systems [AD-A031046] 14 p0210 A77-17255

Ceramic coatings for components exposed to coal-gas environments: A review [ANL-76-124] 16 p0532 A77-31323

**PROTEINS**

Energy and protein production from pulp mill wastes [COO-2983-2] 16 p0557 A77-33645

**PROTON-PROTON REACTIONS**

Details of hydrogen-burning thermonuclear reactions 14 p0168 A77-23457

**PROTOTYPES**

Experience with a prototype solar pond for space heating 16 p0482 A77-49026

Definition study for photovoltaic residential prototype system [NASA-CR-135056] 13 p0113 A77-13533

**PUBLIC HEALTH**

Environmental aspects of coal conversion plant siting and cost of pollution control 14 p0192 A77-27293

Sludge processing to optimize digestibility and energy production 16 p0439 A77-48100

**PUBLIC LAW**

Law and solar energy systems - Legal impediments and inducements to solar energy systems 13 p0018 A77-12401

Solar shade control - New law for a new technology 15 p0306 A77-36764

Energy industry investigation. Part 1: Joint ventures [GPO-72-530] 15 p0391 A77-27499

Energy industry investigation. Part 2: Industry structure [GPO-83-695] 15 p0391 A77-27500

**PUBLIC RELATIONS**

Public participation in energy related decision making, edited transcripts [PB-268781/2] 16 p0559 A77-33674

**PULSE DURATION MODULATION**

Linear model of a dissipative PWM shunt regulator --- Pulse Width Modulation 13 p0080 A77-19172

**PULSE GENERATORS**

Limiting capabilities with respect to electric power generation of a pulsed MHD generator operating at a resistive load 13 p0064 A77-17917

Pulsed energy conversion with a dc superconducting magnet 13 p0081 A77-19293

Threshold capabilities of a pulsed MHD converter for the production of electric power with a resistive load 16 p0399 A77-40591

A half megawatt Pulse Forming Network (PFN) [AD-A039709] 16 p0526 A77-30373

**PULSE TIME MODULATION**

Shaping of laser pulses in an amplifying system receiving input signals with a variable spectrum 13 p0053 A77-15237

**PULSED LASERS**

Shaping of laser pulses in an amplifying system receiving input signals with a variable spectrum 13 p0053 A77-15237

Status of large neodymium glass lasers 14 p0168 A77-23503

Some results of MHD-laser investigation 15 p0328 A77-39549

Soft X-ray lasers [SAND-76-5542] 14 p0219 A77-19425

Heat-pipe bismuth laser; examination of laser action at 4722 Å in bismuth vapor [AD-A039568] 16 p0533 A77-31495

**PULSED RADIATION**

Pulsed energy and switching requirements for Tokamak ohmic heating [LA-OR-76-2473] 15 p0397 A77-27932

**PUMPING**

Water pumping - A practical application of solar energy 13 p0079 A77-19117

**PUMPS**

Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 15 p0284 A77-33409

Geothermal hot water pump --- for use in reservoirs [PB-261741/3] 14 p0251 A77-21711

Geothermal hot water pump, appendix [PB-262030/0] 15 p0347 A77-22652

Installation in Dakar of a pump powered by solar cell panels 16 p0546 A77-32589

**PURSUIT TRACKING**

Performance optimization of an air-to-air missile design 15 p0289 A77-34298

**PYRAMIDAL BODIES**

Solar house heating system using reflective pyramid optical condensing system [COO-2769-4] 16 p0522 A77-29619

**PYRANOMETERS**

Accelerated response of thermopile pyranometers 13 p0019 A77-12405

A method for estimating hourly averages of diffuse and direct solar radiation under a layer of scattered clouds --- for solar collector design 13 p0019 A77-12412

Results from circumsolar radiation measurements [LBL-5292] 15 p0382 A77-26657

Instrumentation for measuring direct and diffuse insolation in testing thermal collectors [CONF-760832-23] 15 p0394 A77-27545

**PYROHELIONETERS**

Autonomous station for the acquisition and concentration of heliometric data 13 p0072 A77-19046

Instrumentation for measuring direct and diffuse insolation in testing thermal collectors [CONF-760832-23] 15 p0394 A77-27545

**PYROLYSIS**

Energy from solid wastes --- Book 13 p0003 A77-10698

Dutchess County, NY moves towards pyrolysis --- of solid wastes with fuel recovery 13 p0010 A77-11298

A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673

# SUBJECT INDEX

# RADIATION ABSORPTION

Stage efficiency in the analysis of thermochemical water decomposition processes 13 p0047 A77-13538

Hydrogen production using solar radiation 13 p0048 A77-13540

Perturbation analysis of second-order effects in kinetics of oil-shale pyrolysis 13 p0070 A77-18585

Demonstration of pyrolysis and materials recovery in San Diego, California 14 p0137 A77-20521

Entropy production, efficiency, and economy in the case of the thermochemical production of synthetic fuels - The sulfuric acid-hybrid process for thermochemical water decomposition 14 p0145 A77-21544

Clean fuels from biomass 14 p0167 A77-23390

Analysis of coal particles undergoing rapid pyrolysis --- in gasification and liquefaction processes 14 p0175 A77-24212

Reactions in the ZnSe thermochemical cycle for hydrogen production 14 p0178 A77-24854

Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078

Mathematical modeling of in situ oil shale retorting 14 p0196 A77-28434

Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023

Coal devolatilization and hydrogasification 14 p0200 A77-29450

The calcium-iodine cycle for the thermochemical decomposition of water 15 p0275 A77-33340

Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur-families 15 p0275 A77-33342

Laboratory investigations on thermochemical hydrogen production 15 p0276 A77-33348

Simple thermal decomposition reactions for storage of solar thermal energy 15 p0292 A77-35153

Torrax - A system for recovery of energy from solid waste. F. J. Page 15 p0293 A77-35163

Flash hydrolysis process for conversion of lignite to liquid and gaseous products 15 p0301 A77-36334

Preliminary economic analysis - Oil and power by COED-based coal conversion 15 p0301 A77-36338

Economics of ethylene production via pyrolysis of coal based Fischer-Tropsch hydrocarbons 15 p0301 A77-36339

Resource recovery and flash pyrolysis of municipal refuse 15 p0313 A77-37657

Large scale hydrogen production utilizing carbon in renewable resources 15 p0321 A77-38527

Thermolysis or electrolysis - Why we choose the latter --- water splitting for hydrogen production 15 p0321 A77-38528

Pyrolysis kinetics for oil-shale particles 16 p0401 A77-41316

Modelling of entrained-bed pulverized coal gasifiers 16 p0401 A77-41321

Mathematical method for determining reaction networks in chemical systems 16 p0418 A77-43093

Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers [WSS/CI PAPER 76-25] 16 p0419 A77-43593

Thermal processing of municipal solid waste for resource and energy recovery --- Book 16 p0438 A77-47951

High temperature thermal energy storage system, Na2SO4 + SO3 reversibly yields Na2S2O7 16 p0450 A77-48764

Reversible oxidation of metal oxides for thermal energy storage 16 p0492 A77-49110

Basic studies of coal pyrolysis and hydrogasification [PB-254878/2] 13 p0096 A77-11511

Production of a hydrocarbon-type synthetic fuel from wood [NRC-15638] 13 p0127 A77-15210

Pyrolysis of oil shale: The effects of thermal history on oil yield [UCRL-77831] 13 p0129 A77-15499

Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation [PB-268232/6] 16 p0542 A77-32051

## Q

**QUALIFICATIONS**  
Testing and fabrication of solar absorbers for the D5A' satellite [CNES-MT-37] 13 p0111 A77-15110

**QUALITY CONTROL**  
The quality category in solar engineering 14 p0143 A77-21310

Assessment of high-efficiency solar cells performance 14 p0148 A77-21785

Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators 15 p0316 A77-37767

Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators 16 p0437 A77-47423

High temperature gas turbine engine component materials testing program [PE-1765-7] 13 p0127 A77-15401

Studies of silicon p-n junction solar cells --- open circuit photovoltage [NASA-CR-149669] 14 p0215 A77-18557

A lightweight solar array study [NASA-CR-152676] 15 p0343 A77-22611

**QUANTITATIVE ANALYSIS**  
Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source 16 p0425 A77-44675

**QUIET ENGINE PROGRAM**  
NASA Quiet Clean General Aviation Turbofan (QCGAT) program status [NASA-TN-X-73564] 15 p0353 A77-23109

Static and wind-on tests of an upper-surface-blown jet-flap nozzle arrangement for use on the Quiet Clean Short-haul Experimental Engine (QCSEB) [NASA-TN-D-8476] 15 p0370 A77-25086

## R

**RADAR IMAGERY**  
Use of radar in geology 13 p0018 A77-12256

**RADIAL FLOW**  
On power-generating thermojunctions with radial flow of current --- for solar energy conversion 16 p0500 A77-50202

**RADIANT COOLING**  
Flight results of a cryogenic cooler designed for Meteosat [IAF PAPER 76-210] 13 p0003 A77-10942

**RADIANT FLUX DENSITY**  
Energetic calculation of the concentrating capacity of paraboloidal facets 13 p0051 A77-14579

Investigation of composite radiant-energy concentrators with conical radiation sources 14 p0143 A77-21313

Energy computation of concentrating capability of paraboloidal facets 15 p0290 A77-34973

**RADIANT HEATING**  
Solar assisted heat pumps: A possible wave of the future [NASA-CR-2771] 13 p0121 A77-14584

**RADIATION ABSORPTION**  
Solar absorption by each element in an absorber-coverglass array 16 p0423 A77-44487

# RADIATION DAMAGE

# SUBJECT INDEX

## RADIATION DAMAGE

Radiation effects on high efficiency silicon solar cells --- for spacecraft application  
16 p0416 A77-42892

## RADIATION DETECTORS

Spectral response of a laterally illuminated p-n junction --- as photodetector or photovoltaic energy converter  
13 p0062 A77-17478  
Fusion products detection system in MigmaCell II  
16 p0436 A77-47363

## RADIATION DISTRIBUTION

Isothermal surface in a radiation field --- in solar thermal energy devices  
13 p0014 A77-11918  
Radiant-vector distribution in the radiant field of a parabolocylindrical concentrator  
13 p0015 A77-11920  
Irradiation field formation on the receiver of 'precise' and 'unprecise' solar concentrators  
13 p0057 A77-16209  
Basis for developing a solar energy inventory  
14 p0179 A77-25360  
Sun power: An introduction to the applications of solar energy --- Book  
15 p0288 A77-33967  
Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser  
15 p0289 A77-34221  
Fundamentals of solar-energy survey development  
16 p0409 A77-41910  
Distribution of direct and total solar radiation availabilities for the USA  
16 p0471 A77-48926  
Use of calculated displaced shapes to define the reflected light pattern from a focused collector  
16 p0473 A77-48948

## RADIATION DOSAGE

Occupational radiation exposure at light water cooled power reactors, 1969-1975  
[PB-257054/7]  
13 p0125 N77-14740

## RADIATION EFFECTS

Radiation effects on high efficiency silicon solar cells  
13 p0064 A77-18072

## RADIATION MEASUREMENT

The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation  
16 p0501 A77-50206  
Results from circumsolar radiation measurements  
[LBL-5292]  
15 p0382 N77-26657

## RADIATION MEASURING INSTRUMENTS

A solar power radiometer  
[AD-A039995]  
16 p0539 N77-31658

## RADIATION PRESSURE

Solar sails --- for radiation pressure displacement guidance  
15 p0267 A77-32215

## RADIATION PROTECTION

Advanced vertical-junction silicon solar cells  
[AIAA PAPER 77-486]  
14 p0172 A77-23906

## RADIATION SOURCES

Investigation of composite radiant-energy concentrators with conical radiation sources  
14 p0143 A77-21313  
Composite concentrators with spherical radiation sources  
14 p0179 A77-25359  
Composite concentrators with spherical radiation sources --- in solar heating systems  
16 p0409 A77-41909

## RADIATIVE HEAT TRANSFER

Isothermal surface in a radiation field --- in solar thermal energy devices  
13 p0014 A77-11918  
The problem of use of solar energy specific features of radiative, heat, and mass transfer in solar installations  
13 p0057 A77-16204  
Annular-flow solar heater collector tubes  
[AIAA PAPER 77-190]  
14 p0135 A77-19886  
Combined cycles in single circuit solar refrigerating systems  
15 p0286 A77-33434

Studies into reduction of radiative heat losses of flat plate solar collectors  
16 p0417 A77-42962

The effect of dropwise condensation on glass solar properties  
16 p0422 A77-44485

Conjugate cycles of single-loop solar power and refrigeration plants  
16 p0427 A77-45547

Radiative heat transfer in cavity type axisymmetric collectors for high-temperature solar energy plants  
16 p0443 A77-48523

Predicted daily and yearly average radiative performance of optimal trapezoidal groove solar energy collectors  
16 p0472 A77-48943

A proposed method of rating the thermal performance of solar collectors  
16 p0473 A77-48946

Radiative characteristics of metallic particle coatings and their applications in selective solar energy collectors  
16 p0545 N77-32587

## RADIATIVE TRANSFER

Study of emittance distribution along the walls of a cellular low-loss cell in the case of a base surface with arbitrary emission indicatrix  
13 p0069 A77-18495

## RADIO FREQUENCY HEATING

Supplementary plasma heating studies in the atomic energy commission, France  
13 p0064 A77-17819  
Additional heating in JET --- plasma energy confinement in Joint European Tokamaks  
16 p0407 A77-41718

## RADIO RELAY SYSTEMS

Experience in using bimodal distribution curves to evaluate the reliability of systems supplying energy from renewable sources --- solar and wind systems for radio relay links  
14 p0201 A77-29535

## RADIO TELESCOPES

A small but important contribution to the German-American solar research programme 'Helios'  
15 p0323 A77-39125

## RADIOACTIVE ISOTOPES

Multipurpose insulation system for a radioisotope fueled Mini-Brayton Heat Source Assembly  
13 p0022 A77-12678  
Isotope heat source for dynamic power systems  
13 p0036 A77-12796  
On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells  
16 p0425 A77-45151  
Analysis of ceramic materials for impact members in isotopic heat sources  
14 p0210 N77-17246  
Experimental screening of carbon-base materials for impact members in isotopic heat sources  
[BML-X-673]  
15 p0396 N77-27901

## RADIOACTIVE MATERIALS

Development of a small radioisotopic heat source  
13 p0042 A77-12852  
Spherical radioisotope thermoelectric generators - An approach to high specific power devices  
13 p0042 A77-12857

## RADIOACTIVE WASTES

Disposal of toxic wastes. I - Electroplating and electrochemical machining wastes. II - Poisonous and radioactive wastes  
15 p0305 A77-36608  
Methods in environmental sampling for radionuclides  
[UCRL-77722]  
13 p0091 N77-10697  
Environmental survey of the reprocessing and waste management portions of the LWR fuel cycle: A task force report  
[PB-258316/9]  
14 p0209 N77-16879

## RADIOACTIVITY

Comparative discussion on measurements of atmospheric natural radioactivity and pollution by coal smoke particles  
15 p0294 A77-35349  
The flow of heat from the earth's interior  
16 p0408 A77-41800  
Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer  
[BLL-SMRE-TRANS-6562-(8313.4)]  
15 p0371 N77-25485

## SUBJECT INDEX

## RANKINE CYCLE

- Modelling the atmospheric dispersal of radioactive pollutants beyond the first few hours of travel  
15 p0395 N77-27603
- RADIOISOTOPE BATTERIES**  
Test and evaluation of the Navy half-watt RTG --- Radioisotope Thermoelectric Generator  
13 p0042 A77-12853  
The low cost high performance generator /LCHPG/ --- space Radioisotope Thermoelectric Generators  
13 p0042 A77-12855  
Principal stages in the development of thermoelectric power in the USSR  
14 p0156 A77-22123  
The selenide isotope generators  
[AIAA PAPER 77-498]  
14 p0173 A77-23916  
Radioisotope power sources in the terrestrial and marine environment  
14 p0196 A77-28170  
An assessment of the materials needs for a Kr-85 fuel capsule  
16 p0462 A77-48855  
Terrestrial RTG designs featuring disc-shaped thermoelectric modules  
16 p0462 A77-48856  
Design of a spherical BTG --- Radioisotope Thermoelectric Generators  
16 p0462 A77-48857  
International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings  
16 p0500 A77-49753
- RADIOLYSIS**  
Radiolytic hydrogen production from a laser fusion system  
13 p0035 A77-12795  
The aqueous homogeneous reactor as a source of hydrogen and of process heat  
15 p0274 A77-33329
- RADIOMETERS**  
A solar power radiometer  
[AD-A039995]  
16 p0539 N77-31658
- RADIUM**  
Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer  
[BLL-SMRE-TRANS-6562-(8:13.4)]  
15 p0371 N77-25485
- RAIL TRANSPORTATION**  
Evolution of thermal traction - From the diesel engine to the gas turbine  
13 p0004 A77-10976  
Electric arc power collection for high-speed trains  
13 p0060 A77-16594  
Amtrak's newest turboliners  
14 p0138 A77-20699  
Will electricity power tomorrow's trains  
14 p0199 A77-29088  
Energy storage propulsion system for advanced concept train --- braking energy recovery  
14 p0200 A77-29467  
Application of gravitational energy exchange to tracked urban transit systems  
14 p0200 A77-29468  
Modelling of electric drive systems for KEW /flywheel/ vehicles  
14 p0200 A77-29469  
Report on Joint Conference Eno Foundation Board of Directors and Board of Consultants, October 13 and 14, 1976  
15 p0260 A77-31064  
Power plants and future fuels; Proceedings of the Conference, London, England, January 21, 22, 1975  
16 p0428 A77-45956  
Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements  
16 p0504 A77-51153  
Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van  
[NASA-TN-X-73638]  
14 p0236 N77-21549  
Fuel efficiency improvement in rail freight transportation: Multiple unit throttle control to conserve fuel  
[PB-262470/8]  
15 p0366 N77-24629  
Evaluation of rail rapid transit and express bus service in the urban commuter market  
[PB-265236/0]  
15 p0398 N77-28046
- RAMAN SPECTRA**  
Raman scattering and the characterisation of atmospheric aerosol particles  
15 p0262 A77-31487  
MHD combustor effluent chemistry measurements using Raman scattering  
16 p0425 A77-44825
- RAMJET ENGINES**  
The intermittent jet for supersonic conditions increased with passage to operating in a ramjet - A low cost engine  
15 p0339 N77-22130
- RAMS (PRESSES)**  
Hydraulic ram effect on composite fuel cell entry walls  
[AD-A024832]  
13 p0115 N77-13548
- RANDOM PROCESSES**  
Contribution to the solution of planning problems in electric power generation /effects of random disturbances/  
15 p0294 A77-35399
- RANKINE CYCLE**  
Solar powered organic Rankine cycle engines - Characteristics and costs  
13 p0036 A77-12798  
A unique Rankine-cycle heat pump system  
13 p0036 A77-12799  
Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800  
Alternate fuel capability of Rankine cycle engines  
13 p0036 A77-12801  
Solar thermal power generation  
13 p0077 A77-19095  
Organic Rankine Cycle Engine development and solar energy utilization  
13 p0077 A77-19096  
Turbines and turbogenerators for solar power plants with thermodynamic cycles  
14 p0152 A77-21828  
The thermodynamic cycle of the ONEROL engine --- solar Rankine piston engine  
14 p0152 A77-21829  
Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes  
14 p0177 A77-24571  
Optimal overall efficiency for a solar radiation collector utilizing a two fluid Rankine Cycle to generate electrical power  
14 p0182 A77-26056  
Gas-fired heat pumps - An emerging technology  
14 p0195 A77-27891  
New options for satellite power systems /SPS/ [AIAA PAPER 77-1028]  
16 p0419 A77-43392  
Light commercial Brayton/Rankine space conditioning system  
16 p0445 A77-48716  
Development of a Stirling engine powered heat activated heat pump  
16 p0448 A77-48745  
An environmental assessment of liquid metal topping cycles --- in coal-fired fluidized bed processors for electric power generation  
16 p0452 A77-48780  
Development status - Binary Rankine cycle waste heat recovery system  
16 p0459 A77-48828  
600 kW Organic Rankine Cycle Waste Heat Power Conversion System  
16 p0459 A77-48829  
Combined diesel-organic Rankine-cycle power plant  
16 p0459 A77-48830  
Thermal energy storage  
16 p0461 A77-48841  
Reactor hybrid-Organic Rankine Cycle Electric Power Systems /ORCEPS/ for space applications  
16 p0463 A77-48858  
Optimum operating conditions for a cylindrical parabolic focusing collector/Rankine power generation cycle system  
16 p0468 A77-48905  
Comparative evaluation of solar heating alternatives [COO-2703-2]  
13 p0129 N77-15498  
Computer modeling of a regenerative solar-assisted Rankine power cycle  
14 p0218 N77-19112

## RAPID TRANSIT SYSTEMS

## SUBJECT INDEX

- Rankine cycle energy conversion system design considerations for low and intermediate temperature sensible heat sources [SAND-76-0363] 14 p0251 N77-21699
- Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant [PB-261564/9] 15 p0349 N77-22684
- Feasibility test on compounding the internal combustion engine for automotive vehicles, task 2 [COO-2690-1] 16 p0512 N77-28495
- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 N77-31207
- RAPID TRANSIT SYSTEMS**
- Transport of the future and the tasks of science 13 p0048 A77-13643
- Electric arc power collection for high-speed trains 13 p0060 A77-16594
- Aerodynamics as a subway design parameter 13 p0070 A77-18721
- Applications of new systems to urban transportation 14 p0137 A77-20392
- Application of gravitational energy exchange to tracked urban transit systems 14 p0200 A77-29468
- Modeling of electric drive systems for KEM /flywheel/ vehicles 14 p0200 A77-29469
- A hydrogen-powered mass transit system 15 p0282 A77-33400
- The politics of urban transportation innovation 15 p0287 A77-33600
- Urban transportation technology --- Book 15 p0324 A77-39467
- Competitive restraints on air travel - Ground modes and telecommunications 16 p0409 A77-41939
- A study of the effects of new transportation systems on urban transportation and environment by computer simulation 16 p0430 A77-46652
- Personal rapid transit research conducted at the Aerospace Corporation [PB-256846/7] 13 p0111 N77-12946
- Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work. Analysis of the Philadelphia-Lindenwood high-speed line [PB-263048/1] 15 p0370 N77-25014
- Study of future paratransit requirements [PB-264082/9] 15 p0376 N77-26028
- Evaluation of rail rapid transit and express bus service in the urban commuter market [PB-265236/0] 15 p0398 N77-28046
- RARE EARTH ELEMENTS**
- Hydrogen atoms: Rare earth ions: Magnetic resonance studies on polycrystalline solids and surface systems relevant to catalysis and other energy-related research 13 p0117 N77-13798
- RARE GASES**
- Experimental fluctuation analysis in a noble gas MHD generator 15 p0326 A77-39535
- RAY TRACING**
- Geometric katoptrics - Applications to solar energy 14 p0166 A77-23383
- An educated ray trace approach to solar tower optics 14 p0204 A77-29592
- Solar flux density distributions on central tower receivers 15 p0256 A77-30318
- Reflection coefficient for a back-surface glass mirror --- of solar collectors 16 p0488 A77-49072
- Effect of angular misorientation on the performance of conical, spherical and parabolic solar concentrators 16 p0502 A77-50221
- REACTION KINETICS**
- The influence of the properties of coals on their conversion into clean fuels 13 p0009 A77-11245
- A new hydrogen storage electrode 13 p0047 A77-13539
- Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541
- Gas release during long-term operation of heat pipes 13 p0050 A77-14328
- Perturbation analysis of second-order effects in kinetics of oil-shale pyrolysis 13 p0070 A77-18585
- Effects of devolatilization kinetics and ash behavior on coal fired MHD combustor design 14 p0141 A77-21248
- Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251
- Reactions in the ZnSe thermochemical cycle for hydrogen production 14 p0178 A77-24854
- Kinetics of heterogeneously catalyzed coal hydroliguefaction 14 p0196 A77-28473
- Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium 14 p0198 A77-28776
- Reactivity heat-treated coals in hydrogen --- for synthetic methane production 14 p0198 A77-28777
- Coal devolatilization and hydrogasification 14 p0200 A77-29450
- Synthetic fuels from solid wastes and solar energy 15 p0275 A77-33336
- The calcium-iodine cycle for the thermochemical decomposition of water 15 p0275 A77-33340
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur-families 15 p0275 A77-33342
- Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353
- An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 15 p0283 A77-33406
- Fundamentals of coal gasification 15 p0308 A77-36809
- Advanced gasification technologies 15 p0308 A77-36811
- Pyrolysis kinetics for oil-shale particles 16 p0401 A77-41316
- Tropospheric oxidation H<sub>2</sub>S 16 p0411 A77-42254
- Mathematical method for determining reaction networks in chemical systems 16 p0418 A77-43093
- Comparative kinetics of high-temperature reaction between H<sub>2</sub>S and selected metal oxides 16 p0424 A77-44608
- Kinetics of gasification in a combustion pot - A comparison of theory and experiment 16 p0440 A77-48176
- Reaction rate analysis of borehole 'in-situ' gasification systems 16 p0440 A77-48177
- Environmental aspects of low Btu gas combustion --- nitrogen oxide emissions from power plants 16 p0440 A77-48178
- High temperature thermal energy storage system, Na<sub>2</sub>SO<sub>4</sub> + SO<sub>3</sub> reversibly yields Na<sub>2</sub>SO<sub>3</sub> 16 p0450 A77-48764
- Reversible oxidation of metal oxides for thermal energy storage 16 p0492 A77-49110
- Liquid phase methanol [PB-257615/5] 14 p0212 N77-17594
- Basic research on ceramic materials for energy storage and conversion systems [COO-2564-2] 16 p0511 N77-28305
- REACTIVITY**
- Reactivity of oil shale carbonaceous residue with oxygen and carbon dioxide [UCRL-77829] 13 p0123 N77-14596
- REACTOR DESIGN**
- Prospects of generating power with laser-driven fusion 13 p0002 A77-10634



- Current status of the magnetic fusion program  
13 p0035 A77-12792
- Heat pipe nuclear reactor for space power  
13 p0036 A77-12797
- The prospect for fusion --- controlled nuclear  
fusion  
13 p0058 A77-16357
- Superconducting induction coil for a doublet  
Tokamak experimental fusion power reactor  
14 p0144 A77-21376
- Operational chemical storage cycles for  
utilization of solar energy to produce heat or  
electric power  
14 p0158 A77-22646
- Prospects for fusion energy  
14 p0178 A77-24928
- Review of the conceptual design of a doublet  
fusion experimental power reactor  
[ASME PAPER 76-WA/NE-9]  
14 p0188 A77-26494
- Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11]  
14 p0188 A77-26496
- Hydrocarbon fuel conditioner for a 1.5 kW fuel  
cell power plant  
14 p0195 A77-28168
- Processing of experimental data with the U-25  
facility with the aid of a data measuring system  
--- MHD generator  
15 p0269 A77-32521
- The aqueous homogeneous reactor as a source of  
hydrogen and of process heat  
15 p0274 A77-33329
- Hydrogen production from coal using a nuclear heat  
source  
15 p0275 A77-33339
- Potential structural material problems in a  
hydrogen energy system  
15 p0281 A77-33389
- Flash hydrolysis process for conversion of  
lignite to liquid and gaseous products  
15 p0301 A77-36334
- Gas turbine HTGR - A total energy utilization option  
--- High Temperature Gas-Cooled Reactor  
[AIAA 77-1016]  
16 p0403 A77-41560
- Adapting the experience of DOD/Industry to  
developing fusion power reactors  
[AIAA 77-1019]  
16 p0404 A77-41561
- Nuclear fusion - Focus on Tokamak  
16 p0407 A77-41645
- Additional heating in JET --- plasma energy  
confinement in Joint European Tokamaks  
16 p0407 A77-41718
- Symposium on Engineering Problems of Fusion  
Research, 6th, San Diego, Calif., November  
18-21, 1975, Proceedings  
16 p0425 A77-44975
- Symposium on Clean Fusion, 1st, Washington, D.C.,  
April 30, 1976, Proceedings  
16 p0435 A77-47355
- Clean fusion concepts and efforts - A survey  
16 p0435 A77-47356
- Studies of deuterium-fueled Tokamak reactors  
16 p0435 A77-47357
- The 1976 status of the Migma program of controlled  
fusion  
16 p0435 A77-47360
- Impact of advanced fuel fusion on electric power  
transmission  
16 p0436 A77-47361
- Methods of 'tailoring' ion distributions in phase  
space /'morphodynamics'/ --- in Migma-type  
fusion reactors  
16 p0436 A77-47364
- Conditions for a boron fusion reactor in the MeV  
range  
16 p0436 A77-47366
- Advanced fuel fusion application to manned space  
propulsion  
16 p0436 A77-47367
- Unified criterion for proximity to controlled fusion  
16 p0436 A77-47369
- Optimization of confinement in a toroidal plasma  
subject to strong radial electric fields  
16 p0438 A77-47958
- Gaseous fuel reactors for power systems  
16 p0468 A77-48906
- Automatic optimization of operating modes in  
thermionic electrical power generators  
[IAF PAPER 77-142]  
16 p0507 A77-51445
- Characteristics of a first generation commercial  
fusion power plant  
[GA-A-13661]  
13 p0093 A77-10891
- Design considerations for a noncircular Tokamak  
demonstration plant  
[GA-A-14074]  
15 p0351 A77-22968
- What is past is prologue: Future directions in  
Tokamak power reactor design research  
[UNFDM-175]  
15 p0358 A77-23951
- Tokamak experimental power reactor  
[CONF-761107-23]  
15 p0397 A77-27946
- Current fusion power plant design concepts  
[BNWL-2013]  
16 p0549 A77-32894
- JET project (design proposal) --- Tokamak experiment  
[EUR-5516]  
16 p0549 A77-32914
- REACTOR MATERIALS**  
The compatibility of containment materials for  
thermochemical hydrogen production  
15 p0276 A77-33347
- Critical materials problems in energy production  
--- Book  
16 p0509 A77-51627
- Tokamak experimental power reactor  
[CONF-761107-23]  
15 p0397 A77-27946
- REACTOR PHYSICS**  
The migma high energy advanced fuel direct  
conversion fusion power plant  
13 p0035 A77-12794
- REACTOR SAFETY**  
Nuclear fusion - Focus on Tokamak  
16 p0407 A77-41645
- Public acceptance of nuclear power  
[IAEA-CN-36/507]  
16 p0555 A77-33630
- Subsea nuclear power generating stations for  
offshore oil production operations. Preliminary  
safety and licensing information document  
[AI-ERDA-13193]  
16 p0556 A77-33637
- REACTOR TECHNOLOGY**  
Fusion power --- nuclear energy technology  
development  
13 p0005 A77-11034
- Studies and thoughts on nuclear reactor systems  
13 p0055 A77-15800
- Concept of a fusion burner  
13 p0061 A77-17014
- World survey of major facilities in controlled  
fusion research --- Book  
13 p0067 A77-18264
- The helium turbine - A power station of the future  
14 p0138 A77-20951
- Review on the IAEA workshop on large fusion  
Tokamak projects  
14 p0146 A77-21737
- The national laser-fusion program  
14 p0168 A77-23502
- Review of the conceptual design of a doublet  
fusion experimental power reactor  
[ASME PAPER 76-WA/NE-9]  
14 p0188 A77-26494
- Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11]  
14 p0188 A77-26496
- Thermonuclear fusion power  
15 p0296 A77-35920
- Systems analysis of accelerator and storage ring  
systems for inertial fusion  
15 p0334 A77-39744
- Heating of the Frascati Tokamak by means of quasi  
perpendicular neutral injection  
16 p0407 A77-41706
- Additional heating and refuelling for the ASDEX  
divertor Tokamak  
16 p0407 A77-41710
- Plasma heating systems planned for the Argonne  
experimental power reactor  
16 p0407 A77-41712
- The contribution of nuclear technology toward the  
solution of energy problems  
[INIS-MP-1867]  
13 p0100 A77-11565
- Optimization of fusion-driven fissioning systems  
[PPPL-1285]  
15 p0342 A77-22469
- Superconducting magnetic energy storage  
[LA-UR-76-2047]  
15 p0397 A77-27933
- Technical and economic studies of small reactors  
for supply of electricity and steam  
[IAEA-CN-36/398]  
16 p0560 A77-33678
- RECEIVERS**  
Irradiation field formation on the receiver of  
'precise' and 'unprecise' solar concentrators  
13 p0057 A77-16209

# RECIPROCATION

# SUBJECT INDEX

Solar flux density distributions on central tower receivers 16 p0484 A77-49038

Central receiver solar thermal power system, phase 1 [SAN/1110-76/T2] 14 p0248 N77-21668

## RECIPROCATION

Analysis of the wind-driven reciprocator 14 p0183 A77-26088

## RECIRCULATIVE FLUID FLOW

Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation 15 p0288 A77-33838

## RECLAMATION

Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-100C7] 13 p0085 N77-10590

Environmental survey of the reprocessing and waste management portions of the LWR fuel cycle: A task force report [PB-258316/9] 14 p0209 N77-16879

Energy recovery from solid waste: A review of current technology [PB-260633/3] 14 p0253 N77-22016

## RECOMBINATION REACTIONS

Reduction of grain boundary recombination in polycrystalline silicon solar cells 14 p0181 A77-25999

## RECTANGULAR GUIDES

Effect of two-dimensional inhomogeneities on the properties of framed MHD channels 16 p0428 A77-46088

## RECTIFIERS

Windmills stage a comeback --- review 13 p0048 A77-13624

A theory of control for a class of electronic power processing systems: Energy-storage dc-to-dc converters [NASA-CR-152696] 15 p0344 N77-22614

## RECYCLING

Energy from solid wastes --- Book 13 p0003 A77-10698

The role of recycling in conservation of metals and energy 13 p0061 A77-16825

Energy and environmental impacts of materials alternatives - An assessment of quantitative understanding 13 p0070 A77-18738

New life for old garbage - Resource and energy recovery from solid wastes 14 p0199 A77-29096

Waste economy and recycling: Problems and practice --- German book 15 p0273 A77-33303

Recovering metal from trash 15 p0287 A77-33529

The Garrett oil-from-waste process and resource recovery system 15 p0293 A77-35162

Recycling trends in the United States: A review [PB-254222/3] 13 p0085 N77-10391

## REDUCED GRAVITY

The International Heat Pipe Experiment --- Black Brant sounding rocket payload zero gravity experiment 13 p0120 N77-14389

## REDUCTION (CHEMISTRY)

Hydrogenation of lignite with synthesis gas 14 p0201 A77-29525

Chemical reduction of SO<sub>3</sub>, particulates and NO<sub>x</sub> emissions 15 p0294 A77-35188

On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells 16 p0425 A77-45151

## REFINING

A laboratory evaluation of precoat filtration parameters for the solvent refined coal process 13 p0059 A77-16474

The production of shale oil crude and its refining into military operational fuels 15 p0292 A77-35155

The ecology of a marine littoral receiving effluents from a petroleum refinery 16 p0433 A77-47173

The production and refining of crude oil into military fuels [AD-A024652] 13 p0095 N77-11207

Trends in refinery capacity and utilization: Petroleum refineries in the United States; foreign refinery exporting centers [PB-256966/3] 13 p0132 N77-15523

XRF analysis of some regenerated catalysts [MRL-TN-388] 15 p0376 N77-26247

Environmental considerations of selected energy conserving manufacturing process options. Volume 4: Petroleum refining industry report [PB-264270/0] 15 p0384 N77-26681

Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation [PB-268232/6] 16 p0542 N77-32051

## REFLECTANCE

Determination of average ground reflectivity for solar collectors 14 p0181 A77-25903

A new Chrome Black selective absorbing surface --- for solar radiation 16 p0406 A77-41585

Determination of average ground reflectivity for solar collectors 16 p0471 A77-48933

Investigation of high temperature performance of thin film, solar-thermal energy converters [PB-265554/6] 16 p0516 N77-28613

Processing on high efficiency solar collector coatings 16 p0526 N77-30286

## REFLECTORS

Performance of low cost solar reflectors for transferring sunlight to a distant collector 14 p0180 A77-25896

Potential of a solar collector with a stationary spherical reflector and a tracking absorber for electrical power production [SAND-76-8039] 15 p0345 N77-22636

## REFRACTORIES

Progress on the testing of refractories for directly-fired MHD air heater service. II 15 p0328 A77-39544

Impact of alternate fuels on industrial refractories and refractory insulation applications: An assessment [ORNL-TM-5592] 15 p0344 N77-22618

## REFRACTORY MATERIALS

Development of sodium/sulfur-cells 13 p0026 A77-12716

High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591

Progress on the testing of refractories for directly-fired MHD air heater service 14 p0142 A77-21254

The French CNRS 1000 kW solar furnace - Description, performance characteristics, present utilization, and perspectives 15 p0262 A77-31473

Corrosion of potential MHD preheater materials in liquid slag and slag-seed 15 p0327 A77-39541

Design and performance of high temperature ceramic electrode modules --- in MHD generators 15 p0327 A77-39543

Development of a turbine rotor of silicon nitride 16 p0503 A77-50651

Practical reasons for investigating ion transport in high temperature insulating materials --- for energy conversion efficiency [CONF-760831-2] 14 p0227 N77-19935

Development and characterization of materials for open cycle MHD [BNWL-2004-3] 16 p0541 N77-31969

## REFRIGERANTS

Selecting refrigerant-absorbent fluid systems for solar energy utilization 14 p0168 A77-23448

Continuous solar air conditioning with ammonia/water absorption cycle 14 p0182 A77-26057

Modelling of a solar-operated absorption air conditioner system with refrigerant storage 16 p0475 A77-48963

# SUBJECT INDEX

# REGRESSION ANALYSIS

- Wetting and surface properties of refrigerants to be used in heat pipes --- surface tension and wall contact angles 13 p0119 A77-14386
- REFRIGERATING**  
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Semiannual Meeting, Dallas, Tex., February 1-5, 1976, Proceedings 14 p0167 A77-23438
- REFRIGERATING MACHINERY**  
Equations for cold production of an absorption refrigerating solar unit 14 p0137 A77-20397  
Aerospace and HVACER: Spinoff '77 - Reaping the dividends --- Heating, Ventilation, Air Conditioning, and Refrigeration 16 p0427 A77-45918  
Assessment and study of existing concepts and methods of cryogenic refrigeration for superconducting transmission cables [COO-2552-6] 14 p0214 A77-18352
- REFRIGERATORS**  
Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106  
Factors affecting the use of solar energy for cooling 13 p0078 A77-19108  
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Seattle, Wash., June 27-July 1, 1976, Proceedings 14 p0170 A77-23651  
Combined cycles in single circuit solar refrigerating systems 15 p0286 A77-33434  
Study of an absorption solar refrigeration unit functioning on a round-the-clock basis 15 p0316 A77-37772  
Conjugate cycles of single-loop solar power and refrigeration plants 16 p0427 A77-45547  
Investigation of solar absorption cooler for round-the-clock operation 16 p0437 A77-47428
- REFUELING**  
Hydrogen vehicular fuel storage as a step in a water splitting cycle 15 p0280 A77-33381  
Hydrogen vehicular fuel storage as a step in a water splitting cycle 14 p0242 A77-21615  
Reliability study of vapor recovery systems at service stations [PB-267613/8] 16 p0560 A77-33700
- REGENERATION**  
Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251
- REGENERATION (ENGINEERING)**  
Regenerative energy sources --- energy conversion and utilization feasibility 15 p0263 A77-31577  
The rate of mass transfer in a solar regenerator 15 p0323 A77-39109  
Argon contamination associated with ceramic regenerative heat exchangers for closed cycle MHD 15 p0326 A77-39536  
The development of small regenerative gas turbines at MTU. II 16 p0401 A77-41258  
Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy 16 p0449 A77-48750  
A new ported constant volume external heat supply regenerative cycle --- for Stirling cycle engines 16 p0465 A77-48885  
A numerical model to evaluate the behavior of a regenerative heat exchanger at high temperature --- for magnetohydrodynamic generator [TH-76-E-66] 15 p0377 A77-26439
- REGENERATIVE COOLING**  
Conceptual design of a 10MW regenerative isobutane geothermal power plant [PB-261563/1] 15 p0349 A77-22683  
Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 A77-31207
- REGENERATIVE FUEL CELLS**  
An off-peak energy storage concept for electric utilities. I - Electric utility requirements 16 p0499 A77-49348
- REGENERATORS**  
Heat-pipe regenerator for gas turbine engine 13 p0020 A77-14528  
Analysis of parameters and characteristics of a bypass turbojet engine operating in a cycle with stepwise heat removal 13 p0063 A77-17765
- REGIONAL PLANNING**  
Studies on the energy system of Hokkaido. I - First attempt: Model-I. II - Various data and their basis. III - Simulations by Model-I 15 p0287 A77-33526  
Solar energy prospects grow for US southwest 15 p0297 A77-36049  
Regional energy availability from conversion of solid waste 15 p0304 A77-36433  
Energy technology assessment - Considerations of geographical scale 15 p0309 A77-36822  
The Wisconsin Regional Energy project - An applied systems analysis approach to regional energy/environment modeling 15 p0309 A77-36825  
Electric energy alternatives appraisal for New York State 16 p0413 A77-42632  
Steam recovery - An alternative for intermediate size regions --- solid waste disposal 16 p0434 A77-47222  
Solar system market capture in the climato-economic regions of the United States 16 p0493 A77-49116  
Rural energy centre for Africa using solar, wind and biogas energies 16 p0496 A77-49139  
Water and energy systems - A planning model 16 p0506 A77-51279  
The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 --- Bolivia [E77-10028] 13 p0096 A77-11491  
Bonneville power administration electric energy conservation study [PB-256766/7] 13 p0115 A77-13550  
Rapid growth from energy projects: Ideas for state and local action. A program guide [PB-257374/9] 13 p0132 A77-15527  
Hydrogen in the seaward advancement of industrial societies 14 p0246 A77-21656  
Electric power development in the Pacific Northwest Region: Institutional commitments and alternatives, phase 1 [PB-262382/5] 15 p0348 A77-22671  
Mathematical models for use in planning regional water resources and energy systems [PB-261364/4] 15 p0352 A77-23022  
The effectiveness of solar energy incentives at the state and local level [PB-263371/7] 15 p0375 A77-25670  
Regional land use and energy modeling [BNL-21809] 15 p0378 A77-26595  
Weather, climate and human settlements [WMO-448] 15 p0387 A77-27038  
Creating energy choices for the western region [ERDA-76-1-PH-3] 16 p0515 A77-28605  
Projects to expand fuel sources in western states. Survey of planned or proposed coal oil shale, tar sand, uranium, and geothermal supply expansion projects, and related infrastructure, in states west of the Mississippi River (as of May 1976) [PB-265633/8] 16 p0516 A77-28614  
Pacific northwest regional assessment program [BNWL-2084] 16 p0540 A77-31674
- REGRESSION ANALYSIS**  
Regression study of solar radiation and electrical energy consumption 14 p0137 A77-20686  
The possibility of using regression models for calculating the effect of weather conditions on electric energy demand 16 p0411 A77-42259

## REGULATIONS

Regulatory reform of air transportation  
[AIAA PAPER 77-276] 13 p0065 A77-18215

State policies for geothermal development.  
Uncovering a major resource 14 p0252 A77-21728  
[PB-261744/7]

Legal and public policy setting for geothermal  
resource development in Hawaii 15 p0343 A77-22596  
[PB-262910/3]

Report of the Presidential task force on reform of  
Federal Energy Administration regulations,  
volume 1 15 p0347 A77-22649  
[PB-262181/1]

Report of the Presidential task force on reform of  
Federal Energy Administration regulations,  
volume 2. Table of contents. Appendixes 15 p0347 A77-22650  
[PB-262182/9]

Perspective on energy policy 15 p0348 A77-22674  
[PB-261736/3]

General Electric Company survey to define impact  
of statewide building codes on solar HVAC  
systems, commercial buildings. National Solar  
Demonstration Program 15 p0383 A77-26674  
[COO-2683-76-11]

Mid-term and long term energy trends 15 p0395 A77-27559  
[PB-264740/2]

National gas survey. Report to the federal power  
commission by the Supply-Technical Advisory Task  
force on the regulatory aspects of substitute gas 16 p0519 A77-29323  
[PB-265877/1]

Energy fact book, 1977 --- energy sources,  
technology, and conservation 16 p0522 A77-29624  
[AD-A038802]

Continuation of the adjustment as a production  
incentive to the maximum weighted average first  
sale price for domestic crude oil (Energy Action  
no. 11) 16 p0530 A77-30636  
[PB-266841/6]

Compilation of energy-related legislation. Volume  
1: Oil, gas, and electric power 16 p0534 A77-31608  
[GPO-80-323]

Compilation of energy-related legislation. Volume  
2: Other energy legislation 16 p0534 A77-31609  
[GPO-80-324]

Report of the Advisory Commission on Electric  
Power Alternatives 16 p0559 A77-33668  
[PB-268479/3]

Building energy conservation programs: A  
preliminary examination of regulatory activities  
at the state level 16 p0559 A77-33673  
[PB-268873/7]

**REINFORCING FIBERS**  
Software aspects of super composites ---  
composition selection to meet user requirements 13 p0053 A77-15301

**RELAY SATELLITES**  
Space-based solar power conversion and delivery  
systems study. Volume 1: Executive summary 13 p0129 A77-15494  
[NASA-CR-150146]

**RELIABILITY ANALYSIS**  
R&M - Today's heating and cooling vs. solar energy 13 p0002 A77-10482

Regression study of solar radiation and electrical  
energy consumption 14 p0137 A77-20686

Some preliminary considerations on photovoltaic  
conversion of solar energy 14 p0164 A77-23299

Experience in using bimodal distribution curves to  
evaluate the reliability of systems supplying  
energy from renewable sources --- solar and wind  
systems for radio relay links 14 p0201 A77-29535

Critical comments concerning the application of  
the availability concept in power plant technology 15 p0265 A77-31850

Integration of solar generation into electric  
utility systems 16 p0404 A77-41562  
[AIAA 77-1020]

Dynamic modeling and sensitivity analysis of solar  
thermal energy conversion systems 16 p0461 A77-48845

**RELIABILITY ENGINEERING**  
Satellite communications for off-shore oil  
operations using WESTAR 13 p0053 A77-15130

Crash test of a liquid hydrogen automobile 15 p0282 A77-33397

## REMOTE REGIONS

A power plant of the Aerosolec type 14 p0153 A77-21839

**REMOTE SENSORS**  
Remote sensing of an underground coal-burn cavity  
with a wide-band induction system 13 p0007 A77-11050

Tracking pollutants from a distance 13 p0067 A77-18370

Utilization of remote sensing techniques to detect  
land use effects on wildland water quality 13 p0071 A77-18984

The uses of air photography /2nd edition/ --- Book 15 p0295 A77-35675

Regional energy availability from conversion of  
solid waste 15 p0304 A77-36433

Energy and aerospace /Sixty-fifth Wilbur and  
Orville Wright Memorial Lecture/ --- aerospace  
contributions to energy conservation 15 p0304 A77-36434

New themes for space: Mankind's future needs and  
aspirations; Proceedings of the Bicentennial  
Space Symposium, Washington, D.C., October 6-8,  
1976 16 p0430 A77-46627

Use of a carbon dioxide laser in remote detection  
of petroleum oil pollution at sea 16 p0433 A77-47080

Remote sensing of geothermic activities of the  
volcanoes Aetna, Stromboli and Vesuv by means of  
infra-red NOAA-VHRR-satellite data --- Italy 13 p0104 A77-12485

**REMOTELY PILOTED VEHICLES**  
Development of a small, low cost turbojet engine  
with thrust augmentation --- for RPV 16 p0434 A77-47347

**REPORTS**  
Advanced coal gasification system for electric  
power generation --- pollution monitoring  
[FE-1514-176] 13 p0088 A77-10653

**RESEARCH AIRCRAFT**  
Hypersonic technology-approach to an expanded  
program 13 p0051 A77-14597

**RESEARCH AND DEVELOPMENT**  
Energy: Mathematics and models; Proceedings of the  
Conference, Alta, Utah, July 7-11, 1975 13 p0008 A77-11233

ERDA's gas turbine development program for the  
next decade 13 p0011 A77-11324

Application of advanced technology to future  
long-range aircraft 13 p0016 A77-12194  
[SAWE PAPER 1126]

An energy center in Sri Lanka --- UN rural energy  
development program 13 p0021 A77-12669

Benefits of hydrogen production research 13 p0032 A77-12768

Survey of hydrogen energy application projects 13 p0033 A77-12778

Current status of the magnetic fusion program 13 p0035 A77-12792

The sigma high energy advanced fuel direct  
conversion fusion power plant 13 p0035 A77-12794

The ERDA Photovoltaic Systems Definition Project 13 p0038 A77-12815

A summary of solar heating and cooling of  
buildings /SHACOB/ - Phase I demonstration  
planning studies 13 p0039 A77-12821

ERDA's Bicentennial Thermionic Research and  
Technology Program 13 p0042 A77-12861

NASA thermionic-conversion program 13 p0043 A77-12863

Operational experience with small wind units 13 p0044 A77-12873

NASA electric propulsion program 13 p0045 A77-13033  
[AIAA PAPER 76-1068]

Can Canada harness the wind 13 p0053 A77-15047

Energy research for physicists 13 p0054 A77-15350

Energy research in the UK 13 p0055 A77-15812

## SUBJECT INDEX

## RESEARCH FACILITIES

Fossil energy research and development in ERDA  
13 p0063 A77-17551

Alkali metal space power technology applicable to  
national energy research and development  
[AIAA PAPER 77-289] 13 p0065 A77-18223

Technical highlights in general aviation  
[AIAA PAPER 77-312] 13 p0066 A77-18237

Overview of the ERDA fusion power program  
13 p0068 A77-18446

Research at the EURATOM-CCF Center --- on solar  
energy  
13 p0080 A77-19126

The technology base for large MHD superconducting  
magnets  
14 p0140 A77-21233

Overview of energy research and development  
administration inertial confinement fusion program  
14 p0146 A77-21744

International cooperation on development of  
hydrogen technologies  
14 p0171 A77-23717

Our energy future: The role of research,  
development, and demonstration in reaching a  
national consensus on energy supply --- Book  
14 p0179 A77-25224

Basic research problems in the generation of  
electrochemical energy for powering small  
private vehicles  
14 p0180 A77-25721

Recent results in the research area 'energetics'  
with respect to nonnuclear energy research  
14 p0200 A77-29300

Effects of selected R&D options on fuel usage in  
the commercial air system  
14 p0201 A77-29472

Photovoltaic systems --- solar energy conversion  
research for military applications  
15 p0288 A77-34112

The EPA role in energy research and development  
15 p0291 A77-35148

Development of the satellite solar power station  
15 p0296 A77-35815

A simple model for solar energy economics in the U.K.  
15 p0298 A77-36245

Energy research overview - Alternatives for energy  
development  
[AAS 75-280] 15 p0304 A77-36555

Research needs report: Energy conversion research  
--- Book  
15 p0313 A77-37646

Federal Fuels from Biomass Energy Program  
15 p0315 A77-37670

Energy R&D modeling for budgetary decisions  
15 p0319 A77-38218

Superconducting magnet development for the MHD  
program  
15 p0331 A77-39569

Solar thermal electricity - Power tower dominates  
research  
16 p0400 A77-40647

Adapting the experience of DOD/Industry to  
developing fusion power reactors  
[AIAA 77-1019] 16 p0404 A77-41561

The NASA Energy Conservation Program  
[AIAA PAPER 77-1005] 16 p0405 A77-41571

Photovoltaics - The semiconductor revolution comes  
to solar  
16 p0407 A77-41638

The roles of aerospace organizations in energy  
development or can aerospace success bring  
success in energy  
[AIAA PAPER 77-1001] 16 p0408 A77-41855

Creating a welcome for aerospace energy technology  
16 p0413 A77-42561

Introduction to the ERDA electric and hybrid  
demonstration program --- electric and hybrid  
vehicle research and development  
16 p0420 A77-43675

Advanced fuel cell technology and applications  
16 p0447 A77-48735

ERDA Fuel Cell Applied Research Program  
16 p0447 A77-48736

Development of the High Seasonal Performance  
Factor Gas Heat Pump --- for space heating  
16 p0448 A77-48744

NASA Thermionic-Conversion program  
16 p0466 A77-48886

Present state and perspective of solar energy  
applications in Mexico  
16 p0469 A77-48911

Overview of Canadian activities in renewable  
energy resources  
16 p0469 A77-48912

Recent Canadian activities in solar heating  
16 p0469 A77-48915

Recent Canadian activities in wind power  
16 p0470 A77-48916

Report on United States international cooperation  
in solar energy technology development  
16 p0495 A77-49132

Georgia Tech 400 KWth solar thermal test facility  
16 p0498 A77-49158

Research and development for Canadian nuclear power  
[AECL-5314] 13 p0097 A77-11533

An analysis of the technology role in US power  
during the mid-range period  
[AD-A024042] 13 p0102 A77-11927

Outlook for research and development in the  
underground gasification of coal  
[PB-256155/3] 13 p0109 A77-12555

Inventory of energy research and development (1973  
- 1975), volume 5  
[GPO-64-734] 13 p0121 A77-14579

Geothermal B and D project report  
[ANCR-1283] 13 p0124 A77-14605

Assessment of the role of magnetic mirror devices  
in fusion power development  
[ERDA-76-74] 14 p0213 A77-17872

Development scenario for laser fusion  
[UCRL-76980] 14 p0216 A77-18575

Fossil energy research program of the Energy  
Research and Development Administration, FY 1977  
[ERDA-76-63] 14 p0222 A77-19611

Description of the solar energy B and D programs  
in many nations  
[SAN/1122-76/1] 14 p0225 A77-19648

Assessment of laser-driven fusion  
[PB-260691/1] 14 p0234 A77-20880

Influence of selected Federal statutes on energy  
development  
[BNWL-2084 (RAP-5)] 15 p0346 A77-22638

Recommendations for a US geothermal research plan.  
Volume 2: Executive summary  
[PB-261568/0] 15 p0346 A77-22642

Recommendations for a geothermal utilization plan,  
Volume 3  
[PB-261569/8] 15 p0346 A77-22643

Perspective on energy policy  
[PB-261736/3] 15 p0348 A77-22674

JPL basic research review --- research and  
advanced development  
[NASA-CR-152689] 15 p0357 A77-23894

Our energy future: The role of research,  
development, and demonstration in reaching a  
national consensus on energy supply  
[PB-263761/9] 15 p0367 A77-24635

The analysis of subsidence associated with  
geothermal development. Volume 2: Research  
report  
[PB-263693/4] 15 p0369 A77-24715

RANN utilization experience (case studies J2  
through 41) --- research applied to national needs  
[PB-263683/5] 15 p0370 A77-25027

National program plan for research and development  
in solar heating and cooling  
[ERDA-76-144] 16 p0514 A77-28597

A half megawatt Pulse Forming Network (PFN)  
[AD-A039709] 16 p0526 A77-30373

Survey of satellite power stations  
[DSE/2071-1] 16 p0532 A77-31225

National benefits/costs of enhanced oil recovery  
research  
[FE-2021-4] 16 p0538 A77-31649

The reporting of federal research and development  
resources applied to innovation  
[PB-266765/7] 16 p0541 A77-32009

NASA authorization, 1978, volume 1, part 2  
[GPO-92-082] 16 p0542 A77-32031

NASA authorization, 1978, volume 1, part 3  
[GPO-92-294] 16 p0542 A77-32032

RESEARCH FACILITIES

The use of geothermal energy at military  
installations  
[AD-A034241] 15 p0366 A77-24626

- Study of Lyndon B. Johnson Space Center utility systems  
[NASA-TM-58196] 15 p0388 N77-27161
- Engineering analysis and testing of water-trickle solar collector  
[ORO-4927-76-2] 15 p0391 N77-27506
- RESEARCH MANAGEMENT**
- Energy R&D modeling for budgetary decisions  
15 p0319 A77-38218
- Daedalophobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada  
16 p0494 A77-49121
- Creating energy choices for the future. Public meeting on A National Plan for Energy Research, Development, and Demonstration  
[CONF-751228-P2] 13 p0087 N77-10646
- Analysis of fiscal year 1977 DOT program by policy and RD and D management objectives. Program levels for fiscal years 1975, 1976, 1977, volume 1  
[PB-255401/2] 13 p0117 N77-13922
- What is past is prologue: Future directions in Tokamak power reactor design research  
[UWPDN-175] 15 p0358 N77-23951
- RESEARCH PROJECTS**
- Energy from solid wastes --- Book  
13 p0003 A77-10698
- Application of solar heat to buildings in Austria  
13 p0079 A77-19114
- Solar heating projects at the Institute for Environmental Research --- in Austria  
13 p0079 A77-19119
- ERDA's hydrogen programs  
15 p0284 A77-33412
- A status report on the USAFA solar energy program  
16 p0478 A77-48993
- Geothermal R and D project  
[TREE-1008] 15 p0393 N77-27538
- Dimensions. Volume 61, number 3 --- with emphasis on air pollution control  
[PB-266957/6] 16 p0531 N77-31019
- Dimensions, volume 61, no. 5  
[PB-267321/8] 16 p0542 N77-32027
- RESERVES**
- Strategic petroleum reserve  
[PB-255476/4] 13 p0098 N77-11546
- Preliminary investigation. Nonproducing gas reserves onshore United States and in the Gulf of Mexico offshore state area, as reported in Federal Commission form 15  
[PB-263434/3] 15 p0355 N77-23597
- Energy self-sufficiency prospects for the British Columbia forest products industry  
[VP-X-166] 15 p0363 N77-24591
- Fuels and energy data: United States by states and census divisions, 1973  
[PB-262362/7] 15 p0367 N77-24636
- A screening for potentially critical materials for the National stockpile  
[PB-267214/5] 16 p0533 N77-31595
- An economic model of new crude oil and natural gas supplies in the lower 48 states  
16 p0552 N77-33596
- Energy policy decisionmaking, organization, and national energy goals  
[PB-269299/4] 16 p0559 N77-33671
- RESERVOIRS**
- Seasonal storage of thermal energy in water in the underground --- reservoirs  
13 p0028 A77-12734
- Pressure drawdown and buildup analyses in geothermal reservoirs  
13 p0030 A77-12753
- Power production from high salinity geothermal waters  
14 p0183 A77-26090
- On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs  
16 p0454 A77-48796
- Helical-rotor expander applications for geothermal energy conversion  
[UCRL-52043] 14 p0221 N77-19586
- Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-OR-76-1672] 14 p0221 N77-19597
- Extracting energy from hydraulically-fractured geothermal reservoirs  
[LA-OR-76-848] 14 p0221 N77-19598
- Methodology for ranking geothermal reservoirs in non-electric industrial applications  
[MTR-7241] 14 p0222 N77-19610
- Methods for geothermal reservoir detection emphasizing submerged environments  
[LBL-4495] 14 p0236 N77-21532
- Proceedings of Second Geopressed Geothermal Energy Conference. Volume 3: Reservoir Research and Technology  
[CONF-760222-P3] 14 p0249 N77-21678
- Geothermal hot water pump --- for use in reservoirs  
[PB-261741/3] 14 p0251 N77-21711
- Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir  
[PB-261562/3] 14 p0252 N77-21726
- Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir  
[PB-262391/6] 14 p0252 N77-21731
- Geohydrological environmental effects of geothermal power production, phase 2A  
[PB-261687/8] 15 p0347 N77-22653
- Use of electrical methods for the delineation of geothermal reservoirs  
[PB-261507/8] 15 p0351 N77-22750
- The Hawaii geothermal project, initial phase 2 progress report  
[PB-263120/8] 15 p0355 N77-23594
- Preliminary investigation. Nonproducing gas reserves onshore United States and in the Gulf of Mexico offshore state area, as reported in Federal Commission form 15  
[PB-263434/3] 15 p0355 N77-23597
- Development of an assessment methodology for geopressurized zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in south Texas  
[COO-2687-5] 15 p0361 N77-24571
- Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 N77-26669
- Computer simulation of geothermal reservoirs  
[PB-265104/0] 15 p0395 N77-27564
- Pumped storage potential of the Hell's Canyon area  
[PB-267722/7] 16 p0539 N77-31664
- Numerical simulation of United States Gulf Coast geothermal geopressured reservoirs  
16 p0545 N77-32585
- RESIDENTIAL AREAS**
- Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864
- Technical prospects for commercial and residential distribution and utilization of hydrogen  
15 p0283 A77-33404
- Historical patterns of residential and commercial energy uses  
15 p0298 A77-36244
- Energy and economic effects of residential energy conservation programs  
16 p0448 A77-48743
- Solar residential demonstration program  
16 p0469 A77-48914
- Residential application of photovoltaic energy systems  
16 p0497 A77-49155
- National Emissions Data Systems (NEDS) fuel use report, 1973  
[PB-253908/8] 13 p0083 N77-10220
- Evaluation of the air-to-air heat pump for residential space conditioning  
[PB-255652/0] 13 p0108 N77-12545
- Definition study for photovoltaic residential prototype system  
[NASA-CR-135039] 13 p0113 N77-13532
- Intermediate minimum property standards for solar heating and domestic hot water systems  
[PB-257086/9] 13 p0132 N77-15525
- Integrating community utilities for resource conservation  
[PB-256898/8] 13 p0133 N77-15923
- Residential energy use alternatives to the year 2000  
[CONF-760648-1] 14 p0223 N77-19625
- Engineering-economic model of residential energy use  
[ORNL-TM-5470] 14 p0231 N77-20580
- Simple home heating system (what can be done now)  
[UCRL-77875] 14 p0232 N77-20598

## SUBJECT INDEX

## RESOURCES MANAGEMENT

- Design, construction, and testing of a residential solar heating and cooling system [COO-2577-10] 14 p0248 N77-21670
- MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems [ORNL-HUD-MIUS-6] 14 p0249 N77-21684
- National program for solar heating and cooling of buildings: Project data summaries. Volume 1: Commercial and residential demonstration [ERDA-76-127] 15 p0346 N77-22639
- NASA Technology Utilization House technical support package [NASA-TM-X-74686] 15 p0358 N77-24011
- Energy management in residential and small commercial buildings [BVL-50576] 15 p0392 N77-27511
- Savings in energy consumption by residential heat pumps: the effects of lower indoor temperatures and of night setback [ORNL-COM-4] 16 p0529 N77-30628
- Residential demand for energy, volume 1 [EPRI-EA-235-VOL-1] 16 p0530 N77-30629
- RESIDUAL GAS**
- Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases 14 p0195 A77-28050
- Hydrogen production from coal liquefaction residues [PB-261734/8] 15 p0350 N77-22687
- RESIDUES**
- Hydrogen production from coal liquefaction residues [EPRI-AP-233] 16 p0551 N77-33374
- RESIN BONDING**
- Influence of bonding and filling agents on the activity of tungsten carbide hydrogen electrodes 15 p0260 A77-31173
- RESISTANCE HEATING**
- Operational report on an integrated solar-assisted optimized heat pump system 14 p0171 A77-23658
- Minor radius compression experiments --- for ohmic heating efficiency improvement in Tokamaks 16 p0407 A77-41683
- RESISTORS**
- The 275 deg C microcircuitry: Resistors, capacitors, conductors, substrates, and bonding [SAND-76-0611] 15 p0389 N77-27312
- RESONANT FREQUENCIES**
- Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator [NASA-TM-73718] 16 p0529 N77-30611
- RESONANT VIBRATION**
- Study of the feasibility of exploiting the galloping phenomenon as energy source 16 p0407 A77-41722
- RESOURCE ALLOCATION**
- Energy analysis in modelling 13 p0007 A77-11047
- Allocation of standby power units in terms of the output power, in planning the development of power systems 14 p0167 A77-23406
- The application of linear programming methods to the problem of choosing required reserves of energy for controlled plants 14 p0196 A77-28255
- The Energy Supply Planning Model - A working tool for regional analysis of alternative national energy policies 15 p0319 A77-38221
- Management analysis of nuclear allocation for the generation of electricity 16 p0413 A77-42590
- National Airlines Fuel Management and Allocation Model 16 p0419 A77-43399
- Mandatory Canadian crude oil allocation regulations [PB-255319/6] 13 p0096 N77-11509
- Economics of depletable resources: Market forces and intertemporal bias [PB-255623/1] 13 p0111 N77-12930
- The exploration, development, and production of Naval Petroleum Reserve Number 4 [PB-255547/4] 13 p0124 N77-14610
- Projected natural gas curtailments and potential needs for additional alternate fuels, 1976-1977 heating season 14 p0235 N77-21257
- Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply [PB-263761/9] 15 p0367 N77-24635
- Study to assess the application of shadow pricing techniques to national energy resource planning [BNL-50537] 15 p0369 N77-24997
- Magma energy research project, volume 2, no. 2 [SAND-76-0264-VOL-2-NO-2] 15 p0372 N77-25638
- RESOURCES**
- A simplified equilibrium model of the US energy-economic system and its use in comparing alternatives 14 p0247 N77-21662
- Strategic petroleum reserve plan (Public Law 94-163, section 154) [PB-261737/1] 15 p0342 N77-22591
- Energy sources for tomorrow [ERDA-TR-226] 15 p0391 N77-27507
- RESOURCES MANAGEMENT**
- Oil shale development 13 p0023 A77-12693
- In situ recovery of oil and minerals from Piceance Creek Basin oil shale 13 p0023 A77-12694
- The role of recycling in conservation of metals and energy 13 p0061 A77-16825
- Energy and environmental impacts of materials alternatives - An assessment of quantitative understanding 13 p0070 A77-18738
- Worldwide energy development - Delayed opportunities 14 p0147 A77-21762
- Ways of improving fuel utilization in industry 15 p0265 A77-31935
- Present status of resources development --- of geothermal energy in world nations 15 p0286 A77-33523
- An update of world geothermal energy development 15 p0286 A77-33524
- Economics of alternative energy sources 15 p0288 A77-33755
- On strategies and fate --- energy and resources utilization 16 p0402 A77-41423
- Methodological questions concerning the evaluation of the economic potential of energy resources 16 p0412 A77-42262
- Environmental Pollution Symposium on Practical Alternatives to Present Urban Life, 5th, Menlo Park, Calif., May 12, 13, 1976, Proceedings 16 p0415 A77-42854
- The United States energy dilemma - How can we solve it 16 p0415 A77-42855
- Patterns of energy use and the critical choices ahead 16 p0415 A77-42856
- Experience in constructing a solar energy cadastral survey 16 p0443 A77-48525
- Helium resources of the United States, 1973 [PB-252473/4] 13 p0085 N77-10623
- A basis for analyzing prospective power generation in terms of environmental management and energy use 13 p0096 N77-11526
- Strategic petroleum reserve [PB-255476/4] 13 p0098 N77-11546
- An analysis of the technology role in US power during the mid-range period [AD-A024042] 13 p0102 N77-11927
- Crude supply alternatives for the Northern Tier states. Volume 1: Executive summary [PB-255992/0] 13 p0107 N77-12531
- Crude supply alternatives for the Northern Tier states. Volume 2: Technical report [PB-255993/8] 13 p0107 N77-12532
- Energy fact book 1976, chapters 1 through 21 [AD-A028284] 14 p0218 N77-18592
- Recovery of inaccessible coal reserves by in situ gasification [CONF-760906-5] 14 p0224 N77-19636
- California's energy future [AD-A032221] 15 p0348 N77-22667
- Mathematical models for use in planning regional water resources and energy systems [PB-261364/4] 15 p0352 N77-23022

# RETROFITTING

# SUBJECT INDEX

Energy management guide for light industry and commerce. EPIC energy management series [PB-263121/6] 15 p0356 N77-23616

Energy and resource planning group [UCRL-50029-76] 15 p0372 N77-25634

Optimal drawdown strategy for strategic petroleum reserves [PB-265838/3] 16 p0512 N77-28569

FFA: Final reports on oil and gas resources, reserves, and productive capacities [GPO-80-748] 16 p0534 N77-31606

Mineral resources: Potentials and problems [USGS-CIEC-698] 16 p0544 N77-32563

**RETROFITTING**

Compatible building design --- for solar heating retrofits 16 p0423 A77-44497

The Lowell Observatory experimental solar heating module 16 p0476 A77-48976

Design and construction of a residential solar heating system at Fermilab 16 p0476 A77-48977

Residential solar heating retrofit in the urban environment 16 p0478 A77-48992

A status report on the USAFA solar energy program 16 p0478 A77-48993

Energy conservation through residential solar retrofit 16 p0479 A77-48994

Project Sunshower - San Jose State University dormitory retrofit to solar-assisted water heating 16 p0479 A77-48996

Solar retrofit applications for public buildings 16 p0479 A77-48997

System performance of first residential solar installation in Charlottesville, Virginia, U.S.A. - Retrofitted indoor swimming pool 16 p0479 A77-48999

Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131

**REUSABLE LAUNCH VEHICLES**

Technology requirements for advanced earth-orbital transportation systems: Summary report --- single stage to orbit vehicles [NASA-CR-2867] 16 p0550 N77-33255

**REUSE**

Estimating procedures associated with aircraft modifications [SAWE PAPER 1101] 13 p0016 A77-12181

**REVENUE**

Evaluating revenue sources for public transit - A new frontier for environmental planners 13 p0070 A77-18723

**REVIEWING**

Energy and technology review [UCRL-52000-76-8] 15 p0345 N77-22627

Geothermal technoecosystems and water cycles in arid lands [PB-263091/1] 15 p0354 N77-23592

Review of solar cooling [CONF-760842-9] 15 p0393 N77-27535

An overview of concepts for aircraft drag reductions 16 p0543 N77-32092

In-situ coal gasification: Status of technology and environment impact [PB-268576/6] 16 p0548 N77-32613

Overview and review of motor gasoline desulfurization, volume 1 [BERC/RI-76/17-VOL-1] 16 p0551 N77-33377

**REYNOLDS NUMBER**

The influence of the Reynolds number on the profiles of velocity and concentration in free jets of different density 13 p0069 A77-18500

**RHENIUM**

The NASA thermionic-conversion /TEC-ART/ program 16 p0438 A77-47960

**RIBBONS**

Alternative strategies for implementing silicon-ribbon technology for photovoltaic applications 13 p0039 A77-12819

Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149815] 14 p0227 N77-19898

Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149814] 14 p0227 N77-19899

**RIGID ROTORS**

Potential aerodynamic analysis of horizontal-axis windmills [AIAA PAPER 77-132] 14 p0135 A77-19848

Self-regulating composite bearingless wind turbine 16 p0491 A77-49095

**RING STRUCTURES**

Energy storage - An interference assembled multiring superflywheel 16 p0450 A77-48761

**RISK**

Risk management of liquefied natural gas installations 13 p0002 A77-10451

**RIVERS**

Predicting the rate of warming of rivers below hydroelectric installations 16 p0437 A77-47749

Characterization and evaluation of wastewater sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976 [PB-255586/0] 13 p0116 N77-13566

**ROCKET ENGINE DESIGN**

Laser propulsion --- rocket heat engine design [IAF PAPER 76-166] 13 p0003 A77-10931

**ROCKS**

Thermal properties of subsurface rocks in the Ukraine 16 p0443 A77-48647

Large-scale thermal storage in rock - Construction, utilization, and economics 16 p0451 A77-48769

Energy extraction characteristics of hot dry rock geothermal systems 16 p0455 A77-48798

High-temperature energy storage in native rocks 16 p0492 A77-49104

Heat extraction from hot dry rock masses [PB-256775/8] 13 p0116 N77-13556

Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing [LA-UR-76-1672] 14 p0221 N77-19597

Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir [PB-262391/6] 14 p0252 A77-21731

Geothermal chemistry activities at LASL [LA-6448-PR] 15 p0344 N77-22623

Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 N77-28609

**ROLLER BEARINGS**

A small but important contribution to the German-American solar research programme 'Helios' 15 p0323 A77-39125

**ROOM TEMPERATURE**

Contribution of the heat carried by solar radiation to the thermal balance of a room during the cold season and its effect on domestic fuel consumption 13 p0063 A77-17558

Design and performance studies on a solar room heater 15 p0255 A77-30314

**ROTARY STABILITY**

Whirl stability of the pendulously supported flywheel system [ASME PAPER 77-APM-20] 15 p0323 A77-38831

**ROTATING DISKS**

Flywheel energy storage. I - Basic concepts 15 p0323 A77-39314

**ROTATING ELECTRICAL MACHINES**

Thermal performance of the rotor of the MIT-EPRI 3 MVA superconducting alternator --- cryogenic cooling 14 p0144 A77-21384

Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361

Large-scale applications of superconductivity 16 p0414 A77-42475

**ROTATING FLUIDS**

Fluidisation and gas combustion in a rotating fluidised bed 15 p0264 A77-31674



## ROTATING MIRRORS

- Calorimetry of large solar concentrators  
13 p0038 A77-12814

## ROTOR AERODYNAMICS

- Numerical solution for the unsteady lifting characteristics of variable pitch cross-flow wind turbines  
13 p0044 A77-12871
- Design consideration for the Darrieus rotor --- wind turbines  
13 p0044 A77-12872
- Dual optimum aerodynamic design for a conventional windmill  
13 p0048 A77-13704
- Aerodynamics of the Darrieus rotor  
13 p0050 A77-14559
- Optimum wind-energy conversion systems  
14 p0155 A77-21936
- The application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine  
14 p0156 A77-22142
- Wind energy in practical use: wheels, rotors, mills, wind power plants --- German book  
15 p0271 A77-33114
- A new series of aerofoil sections suitable for aircraft propellers  
15 p0298 A77-36157
- Effects of wind fluctuations on windmill behaviour  
16 p0410 A77-42073
- Segmented and self-adjusting wind turbine rotors  
16 p0468 A77-48902
- Some dynamic problems of rotating windmill systems  
13 p0084 A77-10271

## ROTOR BLADES

- Dual optimum aerodynamic design for a conventional windmill  
13 p0048 A77-13704
- Possibilities for utilizing wind energy  
13 p0056 A77-15853
- Rotor/generator isolation for wind turbines [AIAA 77-372]  
14 p0180 A77-25782
- Wind power - Pipe dream or reality  
16 p0442 A77-48503
- Application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine [SAND-75-0284]  
16 p0521 A77-29612

## ROTOR BLADES (TURBOMACHINERY)

- Potential aerodynamic analysis of horizontal-axis windmills [AIAA PAPER 77-132]  
14 p0135 A77-19848
- Materials and processing approaches to cost competitive wind turbine rotor blades  
14 p0157 A77-22144
- Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills  
16 p0467 A77-48896
- Experimental data and theoretical analysis of an operating 100 kW wind turbine  
16 p0467 A77-48898
- Segmented and self-adjusting wind turbine rotors  
16 p0468 A77-48902
- Early operation experience on the ERDA/NASA 100 kW wind turbine --- rotor blade loads [NASA-TM-X-71601]  
13 p0086 A77-10640
- The optimum configuration of rotor blades for horizontal wind energy converters [NASA-TT-P-17379]  
14 p0210 A77-17562
- Dynamic blade loading in the ERDA/NASA 100 kW and 200 kW wind turbines [NASA-TM-73711]  
16 p0528 A77-30599

## ROTOR SPEED

- Antrak's newest turboliners  
14 p0138 A77-20699
- Flywheel energy storage. II - Magnetically suspended superflywheel  
15 p0323 A77-39315
- Variable speed wind turbines for high wind energy conversions  
16 p0410 A77-42074

## ROTOES

- Optimization and characteristics of a sailing windmill rotor [PB-259898/5]  
14 p0234 A77-20622
- Optimization and characteristics of a Sailing windmill rotor [NSF/RANN/GI-41891/FE/75/4]  
16 p0558 A77-33652

## RUBBER

- Accelerated heat-aging studies on fluororubber in various media  
15 p0264 A77-31750

## ROMANIA

- Hydrogen economy analysis using decision theory  
14 p0247 A77-21663

## RUNNING

- Pace and grade related to the oxygen and energy requirements, and the mechanics of treadmill running  
15 p0396 A77-27689

## RURAL AREAS

- An energy center in Sri Lanka --- UN rural energy development program  
13 p0021 A77-12669
- Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia  
14 p0153 A77-21840
- A farm energy system employing hydrogen storage  
15 p0278 A77-33366
- Wind power for India  
16 p0423 A77-44498
- ERDA/USDA Agricultural Solar Thermal Energy Program  
16 p0470 A77-48921
- Technical and socio-economic aspects of solar energy and rural development in developing countries  
16 p0494 A77-49128
- Rural energy centre for Africa using solar, wind and biogas energies  
16 p0496 A77-49139
- Wind-powered hydrogen electric systems for farm and rural use [PB-259318/4]  
14 p0226 A77-19667

## S

## SAFETY

- Hydrogen safety problems  
14 p0245 A77-21640
- Safety flywheel [NASA-CASE-RQN-10888-1]  
15 p0342 A77-22484

## SAFETY DEVICES

- Crash test of a liquid hydrogen automobile  
15 p0282 A77-33397
- Prototype hydrogen automobile using a metal hydride  
15 p0282 A77-33398
- Hydrogen combustion. Part 1: Investigation of hydrogen flame control methods [CTI-IV-75-01449]  
14 p0235 A77-21204

## SAFETY FACTORS

- Development of a small radioisotopic heat source  
13 p0042 A77-12852
- The importation of liquefied natural gas  
14 p0194 A77-27607
- Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids  
16 p0411 A77-42160
- Engine performance and fire-safety characteristics of water-containing diesel fuels [AD-A036011]  
15 p0377 A77-26330

## SAFETY MANAGEMENT

- Risk management of liquefied natural gas installations  
13 p0002 A77-10451
- Hydrogen safety problems --- fuel systems hazard prevention  
15 p0283 A77-33402
- Safety considerations for high temperature thermal energy storage in fluoride salts  
16 p0451 A77-48768
- Report of the Army Scientific Advisory Panel Ad Hoc Group on fire-safe fuels [AD-A023763]  
13 p0095 A77-11208
- Bibliography on Liquefied Natural Gas (LNG) safety [NASA-TM-X-73408]  
13 p0127 A77-15208
- Energy recovery from municipal solid waste, an environmental and safety mini-overview survey [ATR-76(7518)-7]  
15 p0369 A77-25011

## SAILS

- Comparative wind tunnel investigation of sail profiles for windmills [VTH-191]  
13 p0111 A77-13012

## SAILWINGS

- Optimization and characteristics of a sailing  
windmill rotor  
[PB-259898/5] 14 p0234 N77-20622

## SALINITY

- Exploring stability criteria of solar ponds  
[ASME PAPER 76-WA/HT-62] 14 p0187 A77-26489  
Salt requirement and stability of solar ponds  
16 p0482 A77-49027  
Plan for developing moderate temperature/low  
salinity geothermal resources  
[ANCR-1318] 14 p0223 N77-19614

## SALTON SEA (CA)

- Geothermal development and the Salton Sea  
14 p0194 A77-27352  
Using Salton Sea Geothermal brines for electrical  
power: A review of progress in chemistry and  
materials technology - 1976 Status  
16 p0469 A77-48908  
On shallow-hole temperature measurements. A test  
study in the Salton Sea geothermal field  
[PB-262643/0] 15 p0343 N77-22602

## SALTS

- Molten salt thermal energy storage for utility  
peaking loads  
16 p0451 A77-48765  
Safety considerations for high temperature thermal  
energy storage in fluoride salts  
16 p0451 A77-48768  
Demand sensitive energy storage in molten salts  
16 p0491 A77-49102  
Thermal energy storage with saturated aqueous  
solutions  
16 p0493 A77-49111  
Effect of mechanical cooling devices on ambient  
salt concentration  
[PB-256679/2] 13 p0125 N77-14631  
Storage of thermal energy in molten salts and metals  
[NASA-TT-F-17412] 14 p0220 N77-19574

## SAMPLING

- Development of procedures for the measurement of  
fugitive emissions  
[PB-263992/0] 15 p0368 N77-24671

## SAN JUAN MOUNTAINS (CO)

- Analysis of LANDSAT B imagery as a tool for  
evaluating, developing, and managing the natural  
resources of New Mexico  
[E77-10090] 14 p0214 N77-18511

## SANDWICH STRUCTURES

- Optimization of composite flywheel design  
15 p0260 A77-31044  
Resistance of superconducting-normal  
metal-superconducting sandwiches  
[LBL-5473] 15 p0341 N77-22393

## SATELLITE ANTENNAS

- On the feasibility of small power satellites  
15 p0298 A77-36264  
Antenna design for offshore satellite links  
16 p0442 A77-48493  
On the active and passive CETI from earth  
satellite orbit --- communication with  
extraterrestrial intelligence  
[IAF PAPER A-77-48] 16 p0507 A77-51524

## SATELLITE CONFIGURATIONS

- Space-based solar power conversion and delivery  
systems study. Volume 3: Economic analysis of  
space-based solar power systems  
[NASA-CR-150148] 13 p0129 N77-15496

## SATELLITE CONTROL

- UK, T5 ion engine thrust vector control  
considerations  
[AIAA PAPER 76-1064] 13 p0045 A77-13030

## SATELLITE DESIGN

- Photovoltaic, gravitationally-stabilized  
solid-state, satellite solar power station  
/GSSNPS/  
[AIAA PAPER 77-511] 14 p0173 A77-23927  
Solar cell equipment with concentrating mirrors  
and radiator surfaces  
15 p0324 A77-39494

## SATELLITE LIFETIME

- KIPS - Kilowatt Isotope Power System --- for use  
in satellites  
13 p0041 A77-12837

## SATELLITE OBSERVATION

- Geothermal flux through palagonitized tephra,  
Surtsey, Iceland - The Surtsey  
temperature-data-relay experiment via Landsat-1  
13 p0048 A77-13648

Space: A resource for earth - An AIAA review ---  
Book

- 15 p0269 A77-32440  
Introductory remarks on space observations of  
long-term climatic changes produced by  
escalating energy use  
[IAF PAPER A-77-01] 16 p0507 A77-51508

## SATELLITE ORBITS

- The ATS-6 power system - Hardware implementation  
and orbital performance  
13 p0040 A77-12831

## SATELLITE POWER TRANSMISSION (TO EARTH)

- Photovoltaic and thermal energy conversion for  
solar powered satellites  
[IAF PAPER 76-117] 13 p0003 A77-10913  
Satellite power systems for large-scale power  
generation  
[IAF PAPER 76-118] 13 p0003 A77-10914  
Microwave transmission system for space power  
13 p0014 A77-11818  
Transportation options for solar power satellites  
13 p0040 A77-12829  
Satellite solar power stations and energy relay  
satellites  
13 p0052 A77-14901  
Solar power satellites - Opportunity and challenge  
[AIAA PAPER 77-291] 13 p0065 A77-18224  
A microwave energy converter with a reversing  
magnetic field  
14 p0139 A77-21154

- Space power systems - What environmental impact  
14 p0146 A77-21757

## Powersat - An astronomical energy solution

- 14 p0176 A77-24520

## The development of a satellite solar power station

- 14 p0203 A77-29577

## Space solar power - The transportation challenge

- for Space Shuttle  
15 p0266 A77-32054

## Microwave energy transmission

- [AIAA PAPER 77-529] 15 p0266 A77-32063

## Solar power in space - Energy for the year 2000

- 16 p0399 A77-40519

## Solar satellites - Space key to our power future.

- 16 p0413 A77-42560

## Space-borne power conversion into a microwave beam

- and its impact on the environment of the upper  
atmosphere  
16 p0464 A77-48875

## Optimizing a low cost satellite energy system

- 16 p0465 A77-48877

Space power stations - Space construction,  
transportation, and pre-development, space  
project requirements

- [IAF PAPER 77-64] 16 p0506 A77-51415

## Preliminary report on the CTS transient event

- counter performance through the 1976 spring  
eclipse season  
[NASA-TM-X-73487] 13 p0083 N77-10116

## Space station systems analysis study. Part 1,

- volume 1: Executive study  
[NASA-CR-151102] 13 p0094 N77-11084

## Space station systems analysis study. Part 1,

- volume 2: Technical report  
[NASA-CR-151103] 13 p0094 N77-11085

## Space-to-earth power transmission system

- [NASA-TM-X-73489] 13 p0105 N77-12517

## Satellite power system: Engineering and economic

- analysis summary  
[NASA-TM-X-73344] 13 p0128 N77-15480

## Space-based solar power conversion and delivery

- systems study. Volume 1: Executive summary  
[NASA-CR-150146] 13 p0129 N77-15494

## Space-based solar power conversion and delivery

- systems study. Volume 2: Engineering analysis  
of orbital systems  
[NASA-CR-150147] 13 p0129 N77-15495

## Operations research investigations of satellite

- power stations  
[NASA-TM-X-73372] 14 p0236 N77-21547

## Transmitter experiment package for the

- communications technology satellite  
[NASA-CR-135035] 15 p0360 N77-24332

## Critical areas: Satellite power systems concepts

- [NASA-TM-X-74694] 15 p0362 N77-24585

## SATELLITE SOLAR ENERGY CONVERSION

- Feasibility of a satellite solar power station  
/SSPS/  
13 p0047 A77-13504

## SUBJECT INDEX

## SATELLITE SOLAR POWER STATIONS

Space solar power - An available energy source 13 p0056 A77-15946

Solar power from satellites 14 p0146 A77-21751

Hardened solar photovoltaics [AIAA PAPER 77-484] 14 p0172 A77-23904

Gallium arsenide concentrator system [AIAA PAPER 77-487] 14 p0172 A77-23907

A solar power system with gallium arsenide solar cells [AIAA PAPER 77-519] 14 p0174 A77-23932

Advanced high efficiency wraparound contact solar cell [AIAA PAPER 77-521] 14 p0174 A77-23934

The development of a satellite solar power station 14 p0203 A77-29577

Development of the satellite solar power station 15 p0296 A77-35815

Closed Brayton cycle turbines for satellite solar power stations 15 p0296 A77-35816

On the feasibility of small power satellites 15 p0298 A77-36264

Solar power in space - Energy for the year 2000 16 p0399 A77-40519

Satellite solar power - Will it pay off [AIAA 77-1027] 16 p0404 A77-41567

New options for satellite power systems /SPS/ [AIAA PAPER 77-1028] 16 p0419 A77-43392

Space-based solar power study near completion 16 p0442 A77-48480

Solar power satellites - A system overview 16 p0463 A77-48868

Power satellite construction location considerations --- orbital assembly for solar energy conversion 16 p0463 A77-48869

Design and analysis of a 5000-MW GaAlAs satellite power system 16 p0464 A77-48871

Space power system design and development from an economic point of view 16 p0464 A77-48872

The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station 16 p0464 A77-48874

Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere 16 p0464 A77-48875

Optimizing a low cost satellite energy system 16 p0465 A77-48877

Past experience - Basis for future advanced power systems for communications satellites [IAF PAPER 77-22] 16 p0506 A77-51390

Space-based solar power conversion and delivery systems study. Volume 1: Executive summary [NASA-CR-150146] 13 p0129 A77-15494

Initial technical, environmental, and economic evaluation of space solar power concepts. Volume 1: Summary [NASA-TM-X-74309] 14 p0207 A77-16442

Initial technical environmental, and economic evaluation of space solar power concepts. Volume 2: Detailed report [NASA-TM-X-74310] 14 p0207 A77-16443

Space-based power conversion and power relay systems: Preliminary analysis of alternate systems [NASA-CR-150171] 14 p0207 A77-16447

**SATELLITE SOLAR POWER STATIONS**

Energy - Ecospace --- space law aspects of U.S. and U.S.S.R. solar power proposals [IAF PAPER ISL-76-59] 13 p0004 A77-10970

Transportation options for solar power satellites 13 p0040 A77-12829

Small space station electrical power system design concepts 13 p0040 A77-12835

Feasibility of a satellite solar power station /SSPS/ 13 p0047 A77-13504

Satellite solar power stations and energy relay satellites 13 p0052 A77-14901

Space solar power - An available energy source 13 p0056 A77-15946

Solar power satellites - Opportunity and challenge [AIAA PAPER 77-291] 13 p0065 A77-18224

Perspectives on Satellite Solar Power [AIAA PAPER 77-352] 13 p0066 A77-18257

The economic viability of pursuing a space power system concept [AIAA PAPER 77-353] 13 p0066 A77-18258

The construction of satellite solar power stations from non-terrestrial materials [AIAA PAPER 77-354] 13 p0066 A77-18259

Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312

Solar power from satellites 14 p0146 A77-21751

A rationale for large space-based solar power systems [AIAA PAPER 77-510] 14 p0173 A77-23926

Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station /GSS4PS/ [AIAA PAPER 77-511] 14 p0173 A77-23927

Powersat - An astronomical energy solution 14 p0176 A77-24520

Gravitationally stabilized satellite solar power station in orbit 14 p0196 A77-28421

Alternative approaches to space-based power generation 14 p0199 A77-29066

The development of a satellite solar power station 14 p0203 A77-29577

Solar power satellite transportation 14 p0205 A77-30016

Space solar power - The transportation challenge --- for Space Shuttle [AIAA PAPER 77-529] 15 p0266 A77-32054

Microwave energy transmission [AIAA PAPER 77-540] 15 p0266 A77-32063

Fabrication and assembly of large composite structures in space [AIAA PAPER 77-543] 15 p0266 A77-32065

Assessment of satellite power stations [AIAA PAPER 77-552] 15 p0266 A77-32069

Solar electric power generating stations in space - XXI century energy or a utopia 15 p0269 A77-32470

Development of the satellite solar power station 15 p0296 A77-35815

Closed Brayton cycle turbines for satellite solar power stations 15 p0296 A77-35816

On the feasibility of small power satellites 15 p0298 A77-36264

Space applications for terrestrial resources 15 p0320 A77-38477

Transmission of power from space to earth [AIAA 77-1026] 16 p0404 A77-41566

Large-scale space operations for Solar Power Satellites [AIAA PAPER 77-1031] 16 p0413 A77-42483

Solar satellites - Space key to our power future 16 p0413 A77-42560

New options for satellite power systems /SPS/ [AIAA PAPER 77-1028] 16 p0419 A77-43392

Prospects for satellite power stations [AAS 76-058] 16 p0430 A77-46639

A preliminary cost benefit analysis of space colonization 16 p0431 A77-46771

Powersats - An economic assessment 16 p0431 A77-46775

Barth, an open system - The use of solar energy 16 p0432 A77-46788

Space-based solar power study near completion 16 p0442 A77-48480

Photovoltaic solar power satellites 16 p0463 A77-48866

Solar power satellites - A system overview 16 p0463 A77-48868

Power satellite construction location considerations --- orbital assembly for solar energy conversion 16 p0463 A77-48869

Solar power satellite concepts and potential related space systems 16 p0463 A77-48870

Design and analysis of a 5000-MW GaAlAs satellite power system 16 p0464 A77-48871

# SATELLITE TEMPERATURE

# SUBJECT INDEX

- Space power system design and development from an economic point of view 16 p0464 A77-48872
- Solar power satellite construction - Issues and needed technology 16 p0464 A77-48873
- The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station 16 p0464 A77-48874
- Comparative assessment of orbital and terrestrial central power plants 16 p0465 A77-48878
- Space construction base operations in support of solar power satellite development 16 p0468 A77-48907
- Space power stations - Space construction, transportation, and pre-development, space project requirements [IAF PAPER 77-64] 16 p0506 A77-51415
- Space solar power versus space communications [IAF PAPER A-77-65] 16 p0507 A77-51532
- Socio-economic determinants of a program for lunar industrialization in support of space light development Lunetta and Soletta [IAF PAPER A-77-66] 16 p0507 A77-51533
- International law and solar energy satellites [IAF PAPER SI-77-52] 16 p0508 A77-51561
- International law and the use of outer space for the production of solar power [IAF PAPER SI-77-62] 16 p0508 A77-51565
- Space-to-earth power transmission system [NASA-TM-X-73489] 13 p0105 N77-12517
- Satellite power system: Engineering and economic analysis summary [NASA-TM-X-73384] 13 p0128 N77-15486
- Operations research investigations of satellite power stations [NASA-TM-X-73372] 14 p0236 N77-21547
- Orbital construction support equipment [NASA-CR-151460] 15 p0388 N77-27157
- Statistics of the radiated field of a space-to-earth microwave power transfer system [NASA-TM-X-73684] 16 p0526 N77-30314
- Survey of satellite power stations [DSE/2071-1] 16 p0532 N77-31225
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-155042] 16 p0546 N77-32594
- SATELLITE TEMPERATURE**
- Flight results of a cryogenic cooler designed for Meteorat [IAF PAPER 76-210] 13 p0003 A77-10942
- A precise satellite thermal control system using cascaded heat pipes [AIAA PAPER 77-777] 15 p0312 A77-37282
- Development of space applications of heat pipes at Aerospatiale 13 p0120 N77-14390
- SATELLITE TRANSMISSION**
- Transmission of power from space to earth [AIAA 77-1026] 16 p0404 A77-41566
- On the active and passive CMTI from earth satellite orbit --- communication with extraterrestrial intelligence [IAF PAPER A-77-48] 16 p0507 A77-51524
- SATELLITE-BORNE PHOTOGRAPHY**
- An application of ERTS technology to the evaluation of coal strip mining and reclamation in the northern Great Plains [NASA-CR-149208] 13 p0104 N77-12486
- Evaluation of wind-energy sites from aerial geomorphologic features mapped from LANDSAT imagery. First results [ERDA/NSF-00598/75/T1] 14 p0218 N77-18667
- SAUDI ARABIA**
- Geothermal energy in Saudi Arabia and its use in connection with solar energy 13 p0079 A77-19122
- Optimum design of a single slope solar still in Riyadh, Saudi Arabia 16 p0417 A77-42956
- SCALE (CORROSION)**
- Problems related to operating thermal wells subject to scaling in Hungary 14 p0163 A77-23035
- Using Salton Sea Geothermal brines for electrical power: A review of progress in chemistry and materials technology - 1976 Status 16 p0469 A77-48908
- SCALE MODELS**
- Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant 16 p0445 A77-48717
- SCALING LAWS**
- Tornado-type wind energy system - Basic consideration [ASME PAPER 76-WA/ENER-2] 14 p0185 A77-26431
- Precipitation and scaling in dynamic geothermal systems [ORNL-TM-5649] 14 p0249 N77-21680
- SCANDIUM**
- Measurements of Sc I gf-values --- absorption spectroscopy using heat pipe oven 13 p0058 A77-16270
- SCAVENGING**
- Precipitation scavenging of fossil-fuel effluents [PB-256649/5] 13 p0124 N77-14630
- SCHLIEREN PHOTOGRAPHY**
- Schlieren measurements of a high density x-pinch 13 p0060 A77-16697
- SCHOOLS**
- The Page-Jackson Elementary School solar heating and cooling system 16 p0462 A77-48851
- An analysis on optimal design of solar heating and cooling system for school 16 p0477 A77-48984
- SCHOTTKY DIODES**
- MIS silicon solar cells 13 p0001 A77-10174
- Schottky solar cells on thin epitaxial silicon 13 p0047 A77-13509
- Cuprous oxide Schottky photovoltaic cells as potential solar energy converters 13 p0076 A77-19088
- Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815
- Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818
- Open-circuit voltage of silicon solar cells 14 p0151 A77-21820
- Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038
- Tunnel MIS solar cells 14 p0163 A77-22979
- Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723
- Amorphous silicon solar cells 15 p0259 A77-30733
- Theory of the Schottky barrier solar cell 15 p0266 A77-32116
- Factors which maximize the efficiency of Cr-p-Si Schottky /MIS/ solar cells 15 p0288 A77-34103
- Cast polycrystalline silicon Schottky-barrier solar cells 16 p0503 A77-50295
- Improved backwall cell [NASA-CASE-LEW-12236-1] 14 p0211 N77-17565
- Method for fabricating solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 15 p0363 N77-24593
- Development of a new silicon Schottky photovoltaic energy converter [PB-262491/4] 15 p0373 N77-25654
- Silicon Schottky photovoltaic diodes for solar energy conversion [PB-268457/9] 16 p0547 N77-32604
- SCIENTISTS**
- An analysis of the technology role in US power during the mid-range period [AD-A024042] 13 p0102 N77-11927
- SCINTILLATION COUNTERS**
- Determination of low activities of U-Ba-series elements by a liquid-scintillation spectrometer [BLL-SMBB-TRANS-6562-(8313.4)] 15 p0371 N77-25485
- SCRAP**
- The role of recycling in conservation of metals and energy 13 p0061 A77-16825

## SCRUBBERS

- Stack gas cleanup --- scrubber systems for high-sulfur coal 15 p0317 A77-37939
- Energy reduction in cleaning exhausts containing particulates and noxious gases 16 p0414 A77-42740
- Status of sulfur dioxide removal systems for the electric utility industry 16 p0504 A77-51144

## SEA ICE

- Tests of oil recovery devices in broken ice fields, phase 2 [AD-A025748] 13 p0110 N77-12572

## SEA WATER

- Energy recovery from saline water by means of electrochemical cells 13 p0013 A77-11536
- Electricity from the thermal power of the sea 14 p0176 A77-24218
- Combined production of electrical power and desalinated water by nuclear power plants 15 p0255 A77-30100
- Bioconversion of solar energy in salt water photosynthetic hydrogen production systems 15 p0278 A77-33369
- Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source 16 p0425 A77-44675
- Supercorrodng alloys for generating heat and hydrogen gas 16 p0458 A77-48820
- Studies of biofouling in ocean thermal energy conversion plants 16 p0484 A77-49044
- Physical and biological aspects of thermal pollution in sea water --- forecasting electric power production in Italy [ISS-L-75/14] 13 p0109 N77-12560
- Effect of mechanical cooling devices on ambient salt concentration [PB-256679/2] 13 p0125 N77-14631
- The biodegradation of oil in sea water for naval pollution control [AD-A042375] 16 p0560 N77-33688

## SEASAT PROGRAM

- SEASAT - A candidate ocean industry economic verification experiments [NASA-CR-149228] 13 p0104 N77-12476
- An evaluation of SEASAT-A candidate ocean industry economic verification experiments [NASA-CR-153009] 15 p0361 N77-24561

## SEASAT-A SATELLITE

- An evaluation of SEASAT-A candidate ocean industry economic verification experiments [NASA-CR-153009] 15 p0361 N77-24561

## SEAWEEDS

- The conversion of ocean farm kelp to methane and other products 15 p0314 A77-37662

## SECONDARY FLOW

- Consideration of three-dimensional effects in MHD power generators 14 p0142 A77-21261
- Coupled electrical and fluid calculations in the cross plane in linear MHD generators 15 p0329 A77-39557

## SEDIIMENTARY ROCKS

- In-situ laser retorting of oil shale [NASA-CASE-LEW-12217-1] 14 p0274 N77-18429
- Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application [PB-262372/6] 15 p0347 N77-22654

## SEDIMENTS

- Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis 15 p0298 A77-36254
- A characterization of the sources of petroleum hydrocarbons in Lake Washington 16 p0439 A77-48099
- Mathematical modelling of single-phase nonisothermal fluid flow through porous media [PB-262884/0] 15 p0362 N77-24577

## SEEBECK EFFECT

- Transport theory of 3M high-performance thermoelectric materials 13 p0042 A77-12848

## SEISMIC WAVES

- Geothermal exploration: An evaluation of the microseismic groundnoise method [PB-262575/4] 15 p0343 N77-42603

## SELENIDES

- Transport theory of 3M high-performance thermoelectric materials 13 p0042 A77-12848
- The selenide isotope generators [AIAA PAPER 77-498] 14 p0173 A77-23916
- Photovoltaic properties and junction formation in CuInSe<sub>2</sub> 15 p0305 A77-36584
- CuInSe<sub>2</sub>/CdS thin film solar cells 16 p0486 A77-49062

## SELF RECTIFYING DEVICES

- Advanced low-mass solar array technology [AIAA PAPER 77-488] 14 p0173 A77-23908

## SELF STIMULATION

- Geothermal well stimulation with a secondary fluid 16 p0454 A77-48795

## SEMICONDUCTING FILMS

- Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells 13 p0069 A77-18517
- Investigation of p-Al<sub>x</sub>/Ga<sub>1-x</sub>/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra 14 p0143 A77-21311
- Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell 14 p0149 A77-21797
- Optimal parameters for solar cell films 14 p0150 A77-21805
- Thermoelectric conversion of solar energy by means of refractory B<sub>14</sub>Si compounds 14 p0154 A77-21848
- A comparison of solar photothermal coatings 14 p0204 A77-29584
- CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567
- Spectral reflectance of TiN<sub>x</sub>/ and ZrN<sub>x</sub>/ films as selective solar absorbers 16 p0423 A77-44492
- CuInSe<sub>2</sub>/CdS thin film solar cells 16 p0486 A77-49062
- Semiconductor-electrolyte photovoltaic energy converter [PB-252837/0] 13 p0099 N77-11548
- High-efficiency thin-film GaAs solar cells [PB-258493/6] 14 p0212 N77-17599
- Ternary compound thin film solar cells [PB-262536/6] 15 p0374 N77-25662
- Epitaxial silicon technology for low-cost solar cells [PB-262396/5] 15 p0374 N77-25663
- Development of low cost thin film polycrystalline silicon solar cells for terrestrial applications [PB-266057/9] 16 p0517 N77-28618

## SEMICONDUCTOR DEVICES

- Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324
- The theory of hydrogen production in a photoelectrochemical cell 13 p0075 A77-19075
- A sulfurization process for the preparation of photovoltaic Cu<sub>x</sub>/S and CuInS<sub>2</sub> thin films 13 p0076 A77-19087
- Meeting electric power needs with photovoltaic power systems 13 p0076 A77-19091
- Investigation of a TiO<sub>2</sub>/electrolyte solar cell and the photocatalytic water decomposition 13 p0077 A77-19094
- Theoretical and experimental validation of new sources of electrical energy 14 p0176 A77-24457
- Photovoltaic energy conversion using concentrated sunlight 16 p0402 A77-41516
- Photocell using covalently-bound dyes on semiconductor surfaces 16 p0412 A77-42412

- An electrooptical model for the design of semiconductor solar cells --- French book  
16 p0429 A77-46469
- On the analysis and design of grid structures for p-n junction solar cells  
16 p0497 A77-49156
- SEMICONDUCTOR JUNCTIONS**
- Operation of ITO/Si heterojunction solar cells  
13 p0014 A77-11762
- The lensed high-voltage vertical multijunction solar cell  
13 p0069 A77-18489
- New analysis of a high-voltage vertical multijunction solar cell  
13 p0069 A77-18490
- Reply to 'New analysis of a high-voltage vertical multijunction solar cell'  
13 p0069 A77-18491
- Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells  
13 p0069 A77-18517
- Calculation of the efficiency of a heterojunction solar cell  
14 p0151 A77-21821
- Heterojunctions in photovoltaic devices  
14 p0162 A77-22977
- Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions  
14 p0162 A77-22978
- The physical principles of photoelectric conversion  
14 p0202 A77-29568
- Photovoltaic properties of five II-VI heterojunctions  
14 p0205 A77-29892
- Preparation of CdS/InP solar cells by chemical vapor deposition of CdS  
14 p0205 A77-29893
- Collection efficiency of heterojunction solar cells  
15 p0258 A77-30722
- Spectral response and efficiency relations in semiconductor liquid junction solar cells  
15 p0264 A77-31823
- Photovoltaic properties of GaSe and InSe junctions  
15 p0289 A77-34117
- Stable semiconductor liquid junction cell with 9 percent solar-to-electrical conversion efficiency  
15 p0290 A77-34429
- Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters  
15 p0320 A77-38330
- Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells  
15 p0320 A77-38367
- Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters  
16 p0402 A77-41360
- Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions  
16 p0442 A77-48518
- Applied research on II-VI compound [PB-254637/2]  
13 p0098 A77-11547
- SEMICONDUCTORS (MATERIALS)**
- Description of a new photoelectrochemical generator  
14 p0150 A77-21812
- Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe  
15 p0259 A77-30742
- Basic mechanisms governing solar-cell efficiency  
16 p0486 A77-49060
- SEPARATION**
- The physics of magnetic separation  
15 p0323 A77-39119
- SEPARATORS**
- A two-phase rotary separator demonstration system for geothermal energy conversion  
16 p0456 A77-48807
- New separators for nickel-zinc batteries [NASA-TM-X-3465]  
13 p0121 A77-14585
- Fabrication and testing of large size nickel-zinc cells [NASA-CR-135200]  
16 p0529 A77-30610
- SERT 2 SPACECRAFT**
- Status of SERT 2 thrusters and spacecraft 1976 [NASA-TM-X-73501]  
13 p0083 A77-10149
- SERVICE LIFE**
- R&M - Today's heating and cooling vs. solar energy  
13 p0002 A77-10482
- Advances in component technology for nickel-zinc cells  
13 p0025 A77-12710
- Gas release during long-term operation of heat pipes  
13 p0050 A77-14328
- Principal stages in the development of thermoelectric power in the USSR  
14 p0156 A77-22123
- Computer model of a solar-assisted heating design approach implemented on a minicomputer installation  
15 p0318 A77-38178
- Gaseous electrode development at RMC --- for plasma channel operation in MHD generators  
15 p0325 A77-39530
- Energy output and service life characteristics of high-voltage low-temperature thermopiles  
16 p0442 A77-48517
- On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs  
16 p0454 A77-48796
- SERVOMOTORS**
- Reduction of the transverse edge effect in linear machines with homogeneous secondary armature by changing the air gap configuration  
15 p0310 A77-36939
- SEWAGE**
- Sewage sludge treatment and disposal --- Book  
15 p0298 A77-36127
- Heat treatment of refuse for increasing anaerobic biodegradability  
16 p0550 A77-32995
- SEWAGE TREATMENT**
- Fuel gas and electricity from municipal sewage  
15 p0314 A77-37658
- SNG from refuse and sewage sludge by the BIOGAS process  
15 p0314 A77-37659
- 'Co-disposal' for solid wastes and sewage sludge  
16 p0427 A77-45873
- Heat treatment of refuse for increasing anaerobic biodegradability [PB-252924/6]  
13 p0101 A77-11577
- Feasibility study of a nuclear power-sewage treatment system for the conservation and reclamation of water resources [PB-255630/6]  
13 p0126 A77-14960
- Design of municipal services in support of high rise office buildings [PB-262532/5]  
15 p0370 A77-25021
- SHADOWS**
- Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors  
13 p0069 A77-18450
- Solar shade control - New law for a new technology  
15 p0306 A77-36764
- Synergistic effects of shadowing on a solar collector matrix [SAND-76-0012]  
13 p0122 A77-14587
- Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors [SAND-76-5061]  
15 p0345 A77-22635
- SHAFTS (MACHINE ELEMENTS)**
- Ceramics for the advanced automotive gas turbine engine: A look at a single shaft design [NASA-TM-X-73651]  
15 p0354 A77-23490
- SHALE OIL**
- A preliminary engineering assessment of jet fuel production from domestic coal and shale derived oils  
13 p0023 A77-12690
- Hydrocarbon fuels from oil shale  
13 p0023 A77-12692
- Oil shale development  
13 p0023 A77-12693
- In situ recovery of oil and minerals from Piceance Creek Basin oil shale  
13 p0023 A77-12694
- In situ combustion of Michigan oil shale - Current field studies  
13 p0024 A77-12695
- Retorting of single oil shale blocks with nitrogen and air  
13 p0024 A77-12696
- Perturbation analysis of second-order effects in kinetics of oil-shale pyrolysis  
13 p0070 A77-18585

- Shale oil, tar sands, and related fuel sources ---  
Book 14 p0169 A77-23551
- Characteristics of synthetic crude from crude  
shale oil produced by in situ combustion retorting  
14 p0169 A77-23552
- Characterization of synthetic liquid fuels ---  
analytical separation and spectroscopic techniques  
14 p0169 A77-23554
- Hydrogasification of oil shale 14 p0169 A77-23556
- Production of synthetic crude from crude shale oil  
produced by in situ combustion retorting  
14 p0169 A77-23557
- Solution of silica in Green River oil shale  
14 p0169 A77-23558
- Fracturing oil shale with explosives for in situ  
recovery 14 p0169 A77-23559
- Hydroretorting of oil shale with nuclear process  
heat  
[ASME PAPER 76-WA/ENER-3] 14 p0185 A77-26432
- Fracturing oil shale for in situ retorting  
experiments 14 p0193 A77-27341
- Development of the modified in situ oil-shale  
process 14 p0193 A77-27342
- Combustion of oil-shale carbon residue  
14 p0193 A77-27343
- In-place recovery of multiple products from  
Colorado's saline-mineral-bearing Piceance Basin  
14 p0193 A77-27344
- Mathematical modeling of in situ oil shale retorting  
14 p0196 A77-28434
- Gas-solid heat transfer coefficients in beds of  
crushed oil shale 14 p0196 A77-28472
- Analysis of steranes and triterpanes in geolipid  
extracts by automatic classification of mass  
spectra 15 p0260 A77-31262
- Aviation turbine fuels from shale and coal oils  
15 p0291 A77-35150
- The production of shale oil crude and its refining  
into military operational fuels 15 p0292 A77-35155
- Economic data for a 50,000 BPD Lurgi/Burgas shale  
oil plant 15 p0300 A77-36331
- Problems in the use of oil shale as an energy source  
16 p0399 A77-40523
- Pyrolysis kinetics for oil-shale particles  
16 p0401 A77-41316
- Soluble-salt processes for in-situ recovery of  
hydrocarbons from oil shale 16 p0441 A77-48472
- Science and technology of oil shale --- Book  
16 p0442 A77-48502
- The production and refining of crude oil into  
military fuels  
[AD-A024652] 13 p0095 A77-11207
- Synthesis and analysis of jet fuel from shale oil  
and coal syncrudes  
[NASA-CR-135112] 13 p0103 A77-12230
- Evaluation of a JP-5 type fuel derived from oil  
shale  
[AD-A025417] 13 p0112 A77-13231
- Reactivity of oil shale carbonaceous residue with  
oxygen and carbon dioxide  
[UCRL-77829] 13 p0123 A77-14596
- Pyrolysis of oil shale: The effects of thermal  
history on oil yield  
[UCRL-77831] 13 p0129 A77-15499
- A western regional energy development study:  
Economics. Volume 1: SRI energy model results  
[PB-260835/4] 14 p0251 A77-21706
- Evaluation of combined in-situ and surface  
retorting of oil shale tract C-b  
[PB-261064/0] 15 p0347 A77-22646
- Thermal stability of some aircraft turbine fuels  
derived from oil shale and coal  
[NASA-TM-X-3551] 15 p0370 A77-25345
- Sampling strategy and characterization of  
Potential Emissions from Synfuel Production  
Symposium  
[CONF-760602] 16 p0515 A77-28603
- Approaches to chemical class analyses of fossil  
derived materials  
[CONF-770301-5] 16 p0532 A77-31271
- Water requirements for steam-electric power  
generation and synthetic fuel plants in the  
western United States  
[PB-268067/7] 16 p0540 A77-31661
- SHALES  
In-situ laser retorting of oil shale  
[NASA-CASE-LEW-12217-1] 14 p0214 A77-18429
- Natural gas massive hydraulic fracture research  
and advanced technology project  
[SAND-76-0723] 16 p0536 A77-31630
- SHALLOW WATER  
On shallow-hole temperature measurements. A test  
study in the Salton Sea geothermal field  
[PB-262643/0] 15 p0343 A77-22602
- SHEAR FLOW  
A simple physical model of a magnetohydrodynamic  
generator 16 p0443 A77-48570
- SHEAR PROPERTIES  
Investigation of counterflow shear effects in heat  
pipes  
[AIAA PAPER 77-749] 15 p0311 A77-37262
- Performance gravity-assisted heat pipes operated  
at small tilt angles  
[AIAA PAPER 77-750] 15 p0311 A77-37263
- SHEAR STRESS  
Investigation of performance limits in axial  
groove heat pipes  
[NASA-CR-137912] 13 p0095 A77-11340
- SHIPS  
Design considerations for heat recovery system for  
DD-963 class ship  
[ASME PAPER 77-GT-106] 14 p0197 A77-28616
- Design of an ocean thermal energy plant ship to  
produce ammonia via hydrogen 15 p0274 A77-33335
- Design of low-cost aluminum heat exchangers for  
OTEC plant-ships --- Ocean Thermal Energy  
Conversion 16 p0485 A77-49046
- Design of an ocean thermal energy plant ship to  
produce ammonia via hydrogen 14 p0237 A77-21564
- An evaluation of methanol, ethanol, the propanols,  
and the butanols as ship propulsion fuels  
[AD-A033483] 15 p0354 A77-23277
- SHOCK HEATING  
Non equilibrium ionization in a linear  
magnetohydrodynamic generator, using a high  
pressure supersonic argon flow 15 p0309 A77-36817
- SHOCK TESTS  
Test and evaluation of the Navy half-watt RTG ---  
Radioisotope Thermoelectric Generator 13 p0042 A77-12853
- SHOCK TUBES  
Shock tube for investigations of high-temperature  
MHD generators 13 p0054 A77-15665
- The disk geometry applied to open cycle MHD power  
generation - Experiments and theoretical  
considerations 15 p0325 A77-39531
- SHOCK TUNNELS  
Non-equilibrium MHD power generation using  
non-seeded argon plasma 13 p0004 A77-11022
- SHOCK WAVE INTERACTION  
Investigation of the mechanism of cleaning heating  
surfaces by the pulsation method  
[BLL-N-25448-(5828.4F)] 13 p0112 A77-13235
- SHORT CIRCUITS  
Sensitivity of solar cell performance to  
atmospheric variables. 1: Single cell  
16 p0527 A77-30534
- SHORT HAUL AIRCRAFT  
The dynamics of STOL /The Daniel and Florence  
Guggenheim Lecture/ --- utility aircraft for  
short haul service in remote areas  
[ICAS PAPER 76-01] 13 p0081 A77-19247
- SHORT TAKEOFF AIRCRAFT  
The dynamics of STOL /The Daniel and Florence  
Guggenheim Lecture/ --- utility aircraft for  
short haul service in remote areas  
[ICAS PAPER 76-01] 13 p0081 A77-19247

## SHREDDING

## SUBJECT INDEX

## SHREDDING

Fine shredding of municipal solid waste  
[PB-257105/7] 13 p0133 N77-15919

## SHROUDED TURBINES

Flap-augmented shrouds for aerogenerators  
14 p0183 A77-26085

Potential application of radial splitter diffuser  
to shrouded wind turbines 14 p0199 A77-29071

Compact shrouds for wind turbines  
16 p0416 A77-42891

## SHROUDS

Compact shrouds for wind turbines  
16 p0416 A77-42891

## SIBERIA

The relation between isotopic composition of argon  
and carbon in natural gases  
[NASA-TM-75134] 16 p0531 N77-30680

## SIDE-LOOKING RADAR

Use of radar in geology  
13 p0018 A77-12256

## SIGNAL ANALYSIS

Shaping of laser pulses in an amplifying system  
receiving input signals with a variable spectrum  
13 p0053 A77-15237

## SIGNAL PROCESSING

Development of signal processing algorithms for  
ultrasonic detection of coal seam interfaces  
[NASA-CR-150024] 13 p0085 N77-10610

## SIGNAL RECEPTION

On the active and passive CETI from earth  
satellite orbit --- communication with  
extraterrestrial intelligence  
[IAP PAPER A-77-48] 16 p0507 A77-51524

## SILICA GEL

Fractionation and structural characterization of  
coal liquids  
13 p0C69 A77-18582

## SILICATES

Exploration of molecular sieve zeolites for the  
cooling of building with solar energy  
[PB-266055/3] 16 p0517 N77-28620

## SILICON

Alternative strategies for implementing  
silicon-ribbon technology for photovoltaic  
applications 13 p0039 A77-12819

Deposition of polycrystalline silicon solar cells  
13 p0076 A77-19082

The silicon ribbon solar cell  
13 p0076 A77-19083

Improving MIS silicon solar cells by HF-treatment  
of the insulating oxide layer 14 p0151 A77-21819

100 kilowatt-hours per day with RTC silicon solar  
cells 14 p0153 A77-21835

Temperature dependence of the 10.6-microns  
reflectivity of ITO-coated silicon --- selective  
absorber for solar energy conversion application  
14 p0200 A77-29246

Electronic properties of amorphous silicon in  
solar cell operation 15 p0257 A77-30717

Low-cost solar cells based on large-area  
unconventional silicon 15 p0258 A77-30730

Silicon solar cells on zone-melted  
silicon/graphite substrates 16 p0426 A77-45303

Enhancement of diffusion length in EFG ribbon  
solar cells under illumination --- Edge-defined  
Film-fed Growth 16 p0503 A77-50293

Industrial development of silicon solar cells  
[NASA-TT-F-17139] 13 p0097 N77-11528

Dip coating process: Silicon sheet growth  
development for the large-area silicon sheet  
task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513

Analysis of epitaxial drift field N on P silicon  
solar cells [NASA-TM-X-73563] 13 p0106 N77-12523

Low reflectivity solar cells  
[AD-A025922] 13 p0108 N77-12539

Status of the ERDA/NASA photovoltaic tests and  
applications project [NASA-TM-X-73567] 13 p0114 N77-13537

Demonstration of the feasibility of automated  
silicon solar cell fabrication [NASA-CR-135095] 13 p0129 N77-15492

Silicon ribbon growth by a capillary action  
shaping technique [NASA-CR-149815] 14 p0227 N77-19898

Silicon ribbon growth by a capillary action  
shaping technique [NASA-CR-149814] 14 p0227 N77-19899

Analysis of GaAs and Si solar energy hybrid systems  
[NASA-CR-2800] 14 p0229 N77-20564

Solar breeder: Energy payback time for silicon  
photovoltaic systems [NASA-CR-153060] 15 p0362 N77-24581

Temperature dependence of the photovoltaic  
performance of Si cells under blue, white, and  
near-bandgap irradiation [UCRL-76203] 15 p0381 N77-26652

Development of a high efficiency thin silicon  
solar cell [NASA-CR-153905] 15 p0391 N77-27502

Automated array assembly task, phase 1  
[NASA-CR-153909] 15 p0391 N77-27505

Development of low cost thin film polycrystalline  
silicon solar cells for terrestrial applications  
[PB-266057/9] 16 p0517 N77-28618

Development of standardized specifications for  
silicon solar cells [NASA-CR-135233] 16 p0520 N77-29604

Sensitivity of solar cell performance to  
atmospheric variables. 1: Single cell  
16 p0527 N77-30534

Silicon solar cell testing in concentrated  
sunlight and simulated sunlight 16 p0527 N77-30540

Energy requirement for the production of silicon  
solar arrays [NASA-CR-153409] 16 p0528 N77-30604

Solar silicon via improved and expanded  
metallurgical silicon technology [NASA-CR-153415] 16 p0528 N77-30606

Automated fabrication of back surface field  
silicon solar cells with screen printed  
wraparound contacts [NASA-CR-135202] 16 p0546 N77-32590

SILICON ALLOYS  
Development status of lithium-silicon/iron sulfide  
load leveling batteries 16 p0448 A77-48741

Improved negative electrodes for lithium/iron  
sulfide batteries 16 p0448 A77-48742

SILICON CARBIDES  
Photoelectric and electrical properties of n-SiC -  
n-CdS heterojunctions 16 p0442 A77-48518

SILICON DIOXIDE  
Solution of silica in Green River oil shale  
14 p0169 A77-23558

Advanced vertical-junction silicon solar cells  
[AIAA PAPER 77-486] 14 p0172 A77-23906

Study of silica scaling from geothermal brines  
[PB-262890/7] 15 p0357 N77-23626

SILICON FILMS  
On black solar cells or the tetrahedral texturing  
of a silicon surface 13 p0004 A77-11000

Photovoltaic conversion of solar energy  
13 p0058 A77-16368

Solar energy - The good features of amorphous  
silicon 16 p0438 A77-47850

EFG growth of silicon ribbon for solar cells ---  
Edge-defined Film-fed crystal Growth 16 p0485 A77-49051

Solar energy utilization, solid state science, and  
a high efficiency amorphous-silicon absorber  
16 p0487 A77-49065

SILICON JUNCTIONS  
MIS silicon solar cells 13 p0001 A77-10174

Reducing grain-boundary effects in polycrystalline  
silicon solar cells 13 p0014 A77-11761

Influence of doped-layer parameters on  
photoelectric characteristics of silicon  
photovoltaic cells 13 p0014 A77-11916



- Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509
- Double-faced silicon solar cell system  
13 p0076 A77-19090
- French developments in silicon photovoltaic cells  
14 p0147 A77-21780
- Silicon solar cell development  
14 p0143 A77-21784
- High-efficiency thin silicon solar cells  
14 p0148 A77-21786
- Heterostructures for silicon solar cells  
14 p0151 A77-21817
- Open-circuit voltage of silicon solar cells  
14 p0151 A77-21820
- Analysis of silicon solar cells with stripe geometry junctions  
14 p0156 A77-22079
- Improved theory of the silicon p-n junction solar cell  
14 p0166 A77-23364
- Advanced silicon solar cell production technology [AIAA PAPER 77-485]  
14 p0172 A77-23905
- Advanced vertical-junction silicon solar cells [AIAA PAPER 77-486]  
14 p0172 A77-23906
- Review - Silicon solar cells for terrestrial applications  
14 p0178 A77-25085
- Performance limitations of silicon solar cells  
15 p0257 A77-30711
- Optimization of silicon solar cell design for use under concentrated sunlight  
15 p0257 A77-30714
- Silicon solar cells by high-speed low-temperature processing  
15 p0258 A77-30728
- Performance of n/+/-p silicon solar cells in concentrated sunlight  
15 p0258 A77-30729
- Silicon solar cells on unidirectionally recrystallized metallurgical silicon  
15 p0258 A77-30731
- Fabrication and characterization of thin-film silicon solar cells on alumina ceramic  
15 p0258 A77-30732
- Amorphous silicon solar cells  
15 p0259 A77-30733
- Indium-tin-oxide-silicon heterojunction photovoltaic devices  
15 p0259 A77-30735
- Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells  
15 p0259 A77-30736
- High level concentration of sunlight on silicon solar cells  
15 p0267 A77-32208
- A comparison of GaAs and Si hybrid solar power systems  
16 p0406 A77-41584
- Solar cells for terrestrial applications  
16 p0485 A77-49050
- Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion  
16 p0485 A77-49052
- Large area Czochralski silicon for solar cells  
16 p0486 A77-49054
- Efficient sprayed In<sub>2</sub>O<sub>3</sub>:Sn n-type silicon heterojunction solar cell  
16 p0503 A77-50292
- SILICON NITRIDES**  
Development of a turbine rotor of silicon nitride  
16 p0503 A77-50651
- SILICONES**  
Antiwear additives, wear studies on chemical addition agents for imparting an effective lubricating response in polysiloxane (silicone) fluids  
[AD-A033527]  
15 p0340 A77-22270
- SILVER ALLOYS**  
A comparison of porous silver catalysts in oxygen electrodes of alkaline fuel cells  
13 p0067 A77-18350
- SIMILARITY THEOREM**  
Similarity solutions for mixed convection from horizontal impermeable surfaces in saturated porous media  
[PB-261561/5]  
15 p0342 A77-22432
- SIMPLE HARMONIC MOTION**  
Hydrodynamic basis of wave-energy converters of channel form  
15 p0267 A77-32211
- SIMULATION**  
Mathematical simulation and empirical determination of the aerochemical and thermal atmospheric pollution resulting from energy conversion processes  
[DLR-IB-553-75/1]  
13 p0091 A77-10700
- SINGLE CRYSTALS**  
Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells  
13 p0069 A77-18517
- Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe  
15 p0259 A77-30742
- SINTERING**  
Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells  
15 p0320 A77-38367
- SITES**  
Siting of wind driven apparatus  
13 p0043 A77-12865
- Large scale Wind Energy Conversion System /WECS/ design and installation as affected by site wind energy characteristics, grouping arrangement and social acceptance  
14 p0165 A77-23360
- Where do we locate the moon base --- considering polar regions as preferred lunar observatory sites  
16 p0504 A77-51023
- Strategic petroleum reserve draft environmental impact statement for Central Rock Mine  
[PB-262390/8]  
15 p0362 A77-24572
- Solar radiation atmospheric transmission research, phase 1  
[PB-266010/8]  
16 p0518 A77-28689
- SIZE (DIMENSIONS)**  
A simplified method for calculating required solar collector array size for space heating  
16 p0480 A77-49007
- SIZE DETERMINATION**  
Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator  
[WSS/CI PAPER 76-53]  
16 p0508 A77-51611
- Design of minimum-weight diffusion batteries  
[PB-266217/9]  
16 p0518 A77-28645
- SKY RADIATION**  
Computation of solar radiation design curves  
13 p0072 A77-19049
- SLAGS**  
In-channel observations on coal slag --- in MHD generators  
14 p0139 A77-21222
- Replenishment processes and flow train interaction --- in MHD generators  
14 p0139 A77-21223
- Slag layers in direct coal-fired MHD power generation  
14 p0139 A77-21224
- Crystallization and vaporization studies on synthetic coal slag compositions  
14 p0140 A77-21228
- Thermionic emission characteristics of seeded coal slags  
14 p0140 A77-21229
- Progress on the testing of refractories for directly-fired MHD air heater service  
14 p0142 A77-21254
- Materials utilization in a direct coal-fired MHD generator system  
15 p0292 A77-35151
- Corrosion of potential MHD preheater materials in liquid slag and slag-seed  
15 p0327 A77-39541
- Generator wall slag coating and material corrosion experiments  
15 p0327 A77-39542
- Electrical behavior of slag coatings in coal-fired MHD generators  
15 p0328 A77-39551
- Some properties of coal slags of importance to MHD  
15 p0330 A77-39563
- Electrical conductivity of molten coal slags containing potassium seed  
15 p0330 A77-39565

- Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls  
[NASA-TN-D-8396] 14 p0207 N77-16445
- SLENDER WINGS**  
Energy and economic trade offs for advanced technology subsonic aircraft 14 p0201 A77-29471
- SLUDGE**  
Sewage sludge treatment and disposal --- Book 15 p0298 A77-36127  
'Co-disposal' for solid wastes and sewage sludge 16 p0427 A77-45873  
Sludge processing to optimize digestibility and energy production 16 p0439 A77-48100  
Heat treatment of refuse for increasing anaerobic biodegradability 16 p0550 N77-32995
- SLURRIES**  
Experimental program for the development of peat gasification  
[PE-2469-3] 16 p0558 N77-33650
- SMOKE**  
Evolution of atmospheric pollution /high acidity and black fumes/ in France during 1975 13 p0002 A77-10670  
Infrared extinction spectra of some common liquid aerosols 15 p0290 A77-34561  
Comparative discussion on measurements of atmospheric natural radioactivity and pollution by coal smoke particles 15 p0294 A77-35349
- SMOKE ABATEMENT**  
Sulphur pollution and emission charges 13 p0005 A77-11033
- SNAP 19**  
SNAP 19 Viking RTG mission performance 13 p0041 A77-12840
- SOCIAL FACTORS**  
Economic and social impact of solar powered transportation systems 13 p0079 A77-19120  
The politics of urban transportation innovation 15 p0287 A77-33600  
Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126  
Technical and socio-economic aspects of solar energy and rural development in developing countries 16 p0494 A77-49128  
Socio-economic determinants of a program for lunar industrialization in support of space light development Lunetta and Soletta  
[IAA PAPER A-77-66] 16 p0507 A77-51533  
Legal and public policy setting for geothermal resource development in Hawaii  
[PB-262910/3] 15 p0343 N77-22596  
Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5] 16 p0516 N77-28610  
Regional economic impacts of nuclear power plants  
[BNL-50562] 16 p0540 N77-31676
- SODIUM**  
Development of sodium/sulfur-cells 13 p0026 A77-12716  
Some studies on sodium/sulfur cells 13 p0055 A77-15813  
Sodium/sulphur battery design and development for motive power applications 14 p0161 A77-22905  
Some UK progress in sodium sulphur technology --- battery for electric motor vehicles  
[SAE PAPER 770280] 16 p0424 A77-44563  
A new design for the high-performance sodium-sulfur battery  
[SAE PAPER 770281] 16 p0424 A77-44564
- SODIUM ALLOYS**  
Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 N77-26988
- SODIUM CARBONATES**  
In-place recovery of multiple products from Colorado's saline-mineral-bearing Piceance Basin 14 p0193 A77-27344
- SODIUM CHLORIDES**  
Sodium chloride battery development program for load leveling  
[PB-257570/2] 14 p0208 N77-16456
- SODIUM HYDROXIDES**  
Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407  
Environmental considerations of selected energy conserving manufacturing process options.  
Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689
- SODIUM SULFATES**  
High temperature thermal energy storage system, Na<sub>2</sub>SO<sub>4</sub> + SO<sub>3</sub> reversibly yields Na<sub>2</sub>SO<sub>3</sub> 16 p0450 A77-48764
- SODIUM SULFITES**  
Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407
- SOIL MECHANICS**  
Workshop on Geothermal Reservoir Engineering  
[PB-261319/8] 14 p0251 N77-21709
- SOLAR ACTIVITY EFFECTS**  
Combined studies of the sun and isotope ecology 15 p0271 A77-32868
- SOLAR ARRAYS**  
An integrated photovoltaic/thermal High Intensity Solar Energy System /HISES/ concept for residential applications 13 p0039 A77-12818  
SEP solar array technology development 13 p0040 A77-12825  
Ultralightweight solar array for Naval Sea Control Systems 13 p0040 A77-12828  
The ATS-6 power system - Hardware implementation and orbital performance 13 p0040 A77-12831  
Small space station electrical power system design concepts 13 p0040 A77-12835  
Comparison of candidate solar array maximum power utilization approaches --- for spacecraft propulsion 13 p0041 A77-12836  
Solar photovoltaics - An aerospace technology  
[AIAA PAPER 77-293] 13 p0065 A77-18225  
Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors 13 p0069 A77-18450  
Cylindrical mirror collector field 13 p0074 A77-19071  
French developments in silicon photovoltaic cells 14 p0147 A77-21780  
The current status of the U.S. Photovoltaic Conversion Program 14 p0147 A77-21782  
Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system 14 p0149 A77-21795  
The solar tower as a source of thermal electric energy 14 p0152 A77-21831  
Effect of components on converters --- solar cell array transistor and thyristor performance 14 p0153 A77-21841  
Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975 14 p0154 A77-21850  
Advanced low-mass solar array technology  
[AIAA PAPER 77-488] 14 p0173 A77-23908  
Advanced photovoltaic power systems  
[AIAA PAPER 77-506] 14 p0173 A77-23923  
A solar power system with gallium arsenide solar cells  
[AIAA PAPER 77-519] 14 p0174 A77-23932  
Consideration of encapsulants for photovoltaic arrays in terrestrial applications 14 p0203 A77-29580  
Performance data for a terrestrial solar photovoltaic/water electrolysis experiment 15 p0256 A77-30321  
Photovoltaic systems --- solar energy conversion research for military applications 15 p0288 A77-34112

- Solar electricity for military applications  
15 p0289 A77-34113
- Cost studies on terrestrial photovoltaic power  
systems with sunlight concentration  
16 p0405 A77-41579
- Solar cell array for concentrated sunlight  
16 p0460 A77-48836
- SEP full-scale wing technology development  
16 p0463 A77-48860
- Photovoltaic solar power satellites  
16 p0463 A77-48866
- An assessment of wind-powered generators for  
navigational aids  
16 p0468 A77-48900
- Thermic diode solar panels - A brief summary  
16 p0472 A77-48936
- Turntable solar arrays  
16 p0483 A77-49033
- Design considerations of solar arrays for  
terrestrial applications  
16 p0485 A77-49053
- Status of the ERDA photovoltaic materials and  
device studies  
16 p0486 A77-49056
- LSSA (Low-cost Silicon Solar Array) project  
[NASA-CR-149091]  
13 p0086 A77-10637
- Solar power arrays for the concentration of energy  
[COO-2699-2]  
13 p0087 A77-10651
- Solar power array for the concentration of energy.  
Task 2: Modifications to a specular photometer  
[COO-2699-3]  
13 p0098 A77-11538
- Review of world experience and properties of  
materials for encapsulation of terrestrial  
photovoltaic arrays  
[NASA-CR-149451]  
13 p0106 A77-12524
- Status of the ERDA/NASA photovoltaic tests and  
applications project  
[NASA-TM-X-73567]  
13 p0114 A77-13537
- Solar cell array design handbook, volume 1  
[NASA-CR-149364]  
13 p0118 A77-14193
- Solar cell array design handbook, volume 2  
[NASA-CR-149365]  
13 p0118 A77-14194
- Initial technical, environmental, and economic  
evaluation of space solar power concepts.  
Volume 1: Summary  
[NASA-TM-X-74309]  
14 p0207 A77-16442
- A non-tracking solar energy collector system  
[NASA-CASE-WPO-13813-1]  
14 p0220 A77-19579
- Solar heating retrofit of military family housing  
[AD-A030843]  
14 p0226 A77-19659
- A lightweight solar array study  
[NASA-CR-152676]  
15 p0343 A77-22611
- Solar array maximum power tracking with  
closed-loop control of a 30-centimeter ion  
thruster  
[NASA-TM-X-73643]  
15 p0376 A77-26222
- OTPC annual report to the Division of Solar Energy  
for FY-1976 and the transition quarter  
[BRWL-2154]  
15 p0382 A77-26665
- Research and development of low cost processes for  
integrated solar arrays  
[COO-2721-76-1]  
15 p0383 A77-26670
- Studies on methods of reducing heat losses from  
flat plate solar collectors  
[COO-2557-2]  
15 p0395 A77-27554
- Recent developments in photovoltaic energy by  
ERDA/NASA-LeRC  
16 p0526 A77-30277
- A review of the solar array manufacturing industry  
costing standards  
[NASA-CR-153401]  
16 p0528 A77-30608
- Solar cell shingle  
[NASA-CASE-LEW-12587-1]  
16 p0534 A77-31601
- SOLAR CELLS**
- MIS silicon solar cells  
13 p0001 A77-10174
- On black solar cells or the tetrahedral texturing  
of a silicon surface  
13 p0004 A77-11000
- CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica  
substrates  
13 p0007 A77-11110
- Reducing grain-boundary effects in polycrystalline  
silicon solar cells  
13 p0014 A77-11761
- Operation of ITO/Si heterojunction solar cells  
13 p0014 A77-11762
- Influence of doped-layer parameters on  
photoelectric characteristics of silicon  
photovoltaic cells  
13 p0014 A77-11916
- Thermoelectric power of pseudoternary solid  
solutions  
13 p0014 A77-11917
- The ERDA Photovoltaic Systems Definition Project  
13 p0038 A77-12815
- Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509
- Utilization of solar power - A new departure  
13 p0053 A77-15049
- Photovoltaic conversion of solar energy  
13 p0058 A77-16368
- Radiation effects on high efficiency silicon solar  
cells  
13 p0064 A77-18072
- Solar photovoltaics - An aerospace technology  
[AIAA PAPER 77-293]  
13 p0065 A77-18225
- The lensed high-voltage vertical multijunction  
solar cell  
13 p0069 A77-18489
- New analysis of a high-voltage vertical  
multijunction solar cell  
13 p0069 A77-18490
- Reply to 'New analysis of a high-voltage vertical  
multijunction solar cell'  
13 p0069 A77-18491
- Study of emittance distribution along the walls of  
a cellular low-loss cell in the case of a base  
surface with arbitrary emission indicatrix  
13 p0069 A77-18495
- Preparation and characteristics of CuGaSe<sub>2</sub>/CdS  
solar cells  
13 p0069 A77-18517
- Contribution to the study of solar energy  
collectors - Selective plates and cells  
13 p0072 A77-19051
- Photovoltaic effect applications  
13 p0075 A77-19080
- An analysis of silicon solar cell parameters for  
terrestrial applications  
13 p0076 A77-19081
- Deposition of polycrystalline silicon solar cells  
13 p0076 A77-19082
- The silicon ribbon solar cell  
13 p0076 A77-19083
- Cuprous oxide Schottky photovoltaic cells as  
potential solar energy converters  
13 p0076 A77-19088
- Photovoltaic systems using sunlight concentration  
13 p0076 A77-19089
- Double-faced silicon solar cell system  
13 p0076 A77-19090
- Meeting electric power needs with photovoltaic  
power systems  
13 p0076 A77-19091
- Encapsulation of solar cell modules  
13 p0076 A77-19092
- Alternating photoelectrochemical converters  
13 p0077 A77-19093
- Investigation of a TiO<sub>2</sub>/electrolyte solar cell and  
the photocatalytic water decomposition  
13 p0077 A77-19094
- Preliminary design data for a solar house in  
Riyadh, Saudi Arabia  
13 p0078 A77-19112
- Ceramic thin film CdTe solar cell  
14 p0135 A77-19635
- Response of a partially illuminated solar cell  
14 p0139 A77-21025
- Investigation of p-Al<sub>x</sub>/Ga<sub>1-x</sub>/As-n-GaAs  
heterojunction cells by means of optical  
measurements and photoluminescence spectra  
14 p0143 A77-21311
- Solar power from satellites  
14 p0146 A77-21751
- Thermodynamic constraints, effective temperatures  
and solar cells  
14 p0147 A77-21779
- French developments in silicon photovoltaic cells  
14 p0147 A77-21780
- Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells  
14 p0147 A77-21781
- Silicon solar cell development  
14 p0148 A77-21784

- Assessment of high-efficiency solar cells performance 14 p0148 A77-21785
- High-efficiency thin silicon solar cells 14 p0148 A77-21786
- A novel cover slide for solar cells 14 p0148 A77-21789
- Evaluation of CdS photovoltaic cells in the framework of the development of solar electric power plants 14 p0149 A77-21796
- Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell 14 p0149 A77-21797
- Technology of large area Cu/x/S-CdS solar cells 14 p0149 A77-21798
- Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions 14 p0149 A77-21801
- Investigation on the crystalline structure of Cu/x/S-CdS solar cells 14 p0149 A77-21803
- Optimal parameters for solar cell films 14 p0150 A77-21805
- Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814
- Heterostructures for silicon solar cells 14 p0151 A77-21817
- Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818
- Improving MIS silicon solar cells by HF-treatment of the insulating oxide layer 14 p0151 A77-21819
- Open-circuit voltage of silicon solar cells 14 p0151 A77-21820
- Calculation of the efficiency of a heterojunction solar cell 14 p0151 A77-21821
- 100 kilowatt-hours per day with RTC silicon solar cells 14 p0153 A77-21835
- Photovoltaic test and demonstration project --- residential energy program 14 p0153 A77-21838
- Photovoltaic conversion of solar energy using optical concentration systems 14 p0154 A77-21849
- Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975 14 p0154 A77-21850
- The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854
- Some applications of photovoltaic solar energy 14 p0155 A77-21855
- Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038
- Analysis of silicon solar cells with stripe geometry junctions 14 p0156 A77-22079
- High efficiency n-CdS/p-InP solar cells prepared by the close-spaced technique 14 p0156 A77-22081
- Heterojunctions in photovoltaic devices 14 p0162 A77-22977
- Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions 14 p0162 A77-22978
- Tunnel MIS solar cells 14 p0163 A77-22979
- Advanced technologies for photovoltaic cell fabrication 14 p0165 A77-23300
- Improved theory of the silicon p-n junction solar cell 14 p0166 A77-23364
- Periodically adjustable concentrators adapted to solar cell panels 14 p0166 A77-23385
- Hardened solar photovoltaics [AIAA PAPER 77-484] 14 p0172 A77-23904
- Advanced silicon solar cell production technology [AIAA PAPER 77-485] 14 p0172 A77-23905
- Advanced vertical-junction silicon solar cells [AIAA PAPER 77-486] 14 p0172 A77-23906
- Gallium arsenide concentrator system [AIAA PAPER 77-487] 14 p0172 A77-23907
- A solar power system with gallium arsenide solar cells [AIAA PAPER 77-519] 14 p0174 A77-23932
- Advanced high efficiency wraparound contact solar cell [AIAA PAPER 77-521] 14 p0174 A77-23934
- Performance analysis of a solar-electrical system with a load and storage batteries 14 p0177 A77-24570
- Review - Silicon solar cells for terrestrial applications 14 p0178 A77-25085
- Design considerations for high-intensity solar cells 14 p0179 A77-25591
- The advantages of sun tracking for planar silicon solar cells 14 p0181 A77-25904
- Reduction of grain boundary recombination in polycrystalline silicon solar cells 14 p0181 A77-25999
- Status of silicon solar cell technology 14 p0184 A77-26392
- Bibliography on solar cells 14 p0195 A77-28067
- Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023
- The physical principles of photoelectric conversion 14 p0202 A77-29568
- Photovoltaic energy conversion using concentrated sunlight 14 p0203 A77-29579
- GaAs solar cells for very high concentrations 14 p0204 A77-29581
- An educated ray trace approach to solar tower optics 14 p0204 A77-29592
- Photovoltaic properties of five II-VI heterojunctions 14 p0205 A77-29892
- Preparation of CdS/InP solar cells by chemical vapor deposition of CdS 14 p0205 A77-29893
- Matching of solar cells and performance of a solar battery 15 p0256 A77-30316
- Use of solar generators in Africa for broadcasting equipment 15 p0256 A77-30320
- An isothermal etchback-regrowth method for high-efficiency Ga/1-x/Al/x/As-GaAs solar cells 15 p0257 A77-30372
- Fundamental electronic mechanisms limiting the performance of solar cells 15 p0257 A77-30710
- Performance limitations of silicon solar cells 15 p0257 A77-30711
- Optimization of silicon solar cell design for use under concentrated sunlight 15 p0257 A77-30714
- Electronic properties of amorphous silicon in solar cell operation 15 p0257 A77-30717
- Efficiency calculations for Al/x/Ga/1-x/As-GaAs heteroface solar cells 15 p0257 A77-30720
- Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell 15 p0258 A77-30721
- Collection efficiency of heterojunction solar cells 15 p0258 A77-30722
- Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723
- Silicon solar cells by high-speed low-temperature processing 15 p0258 A77-30728
- Performance of n/+/-p silicon solar cells in concentrated sunlight 15 p0258 A77-30729
- Low-cost solar cells based on large-area unconventional silicon 15 p0258 A77-30730
- Silicon solar cells on unidirectionally recrystallized metallurgical silicon 15 p0258 A77-30731

## SUBJECT INDEX

## SOLAR CELLS CONTD

- Fabrication and characterization of thin-film silicon solar cells on alumina ceramic 15 p0258 A77-30732
- Amorphous silicon solar cells 15 p0259 A77-30733
- Indium-tin-oxide-silicon heterojunction photovoltaic devices 15 p0259 A77-30735
- Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells 15 p0259 A77-30736
- Large-area high-efficiency AlGa/As-GaAs solar cells 15 p0259 A77-30738
- Technology of GaAs metal-oxide-semiconductor solar cells 15 p0259 A77-30739
- InP-CdS solar cells 15 p0259 A77-30740
- Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741
- Spectral response and efficiency relations in semiconductor liquid junction solar cells 15 p0264 A77-31823
- Theory of the Schottky barrier solar cell 15 p0266 A77-32116
- High level concentration of sunlight on silicon solar cells 15 p0267 A77-32208
- Use of transparent heat reflecting coatings in solar energy converters 15 p0285 A77-33430
- A minority carrier MIS solar cell 15 p0288 A77-33799
- Factors which maximize the efficiency of Cr-p-Si Schottky /MIS/ solar cells 15 p0288 A77-34103
- Solar electricity for military applications 15 p0289 A77-34113
- Stable semiconductor liquid junction cell with 9 percent solar-to-electrical conversion efficiency 15 p0290 A77-34429
- The sawtooth coverslide - A new means of coupling light into solar cells 15 p0298 A77-36263
- N-indium tin oxide/p-indium phosphide solar cells 15 p0317 A77-38049
- Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters 15 p0320 A77-38330
- Solar cell equipment with concentrating mirrors and radiator surfaces 15 p0324 A77-39494
- Meteorological effects on solar cells 15 p0338 A77-40149
- CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567
- Upper limit of efficiency for photovoltaic solar cells 16 p0399 A77-40568
- Analysis of the fill factor for n-CdS/p-CdTe solar cells 16 p0402 A77-41433
- Sheet resistance component of series resistance in a solar cell as a function of grid geometry 16 p0402 A77-41437
- Photovoltaic energy conversion using concentrated sunlight 16 p0402 A77-41516
- Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563
- Cost studies on terrestrial photovoltaic power systems with sunlight concentration 16 p0405 A77-41579
- The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583
- A comparison of GaAs and Si hybrid solar power systems 16 p0406 A77-41584
- Photovoltaics - The semiconductor revolution comes to solar 16 p0407 A77-41638
- High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741
- Photocell using covalently-bound dyes on semiconductor surfaces 16 p0412 A77-42412
- Radiation effects on high efficiency silicon solar cells --- for spacecraft application 16 p0416 A77-42892
- Silicon solar cells on zone-melted silicon/graphite substrates 16 p0426 A77-45303
- GaAs double-heterostructure photodetectors --- solar cell design 16 p0426 A77-45304
- Utilization of transparent heat-reflecting coatings in solar-energy converters 16 p0426 A77-45543
- An electrooptical model for the design of semiconductor solar cells --- French book 16 p0429 A77-46469
- Solar energy - The good features of amorphous silicon 16 p0438 A77-47850
- Degradation of solar cell efficiency by sheet resistance 16 p0438 A77-47854
- Environmental impact of major solar power development 16 p0452 A77-48773
- Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835
- Solar cell array for concentrated sunlight 16 p0460 A77-48836
- Design and analysis of a 5000-MW GaAlAs satellite power system 16 p0464 A77-48871
- Solar cells for terrestrial applications 16 p0485 A77-49050
- EPG growth of silicon ribbon for solar cells --- Edge-defined Film-fed crystal Growth 16 p0485 A77-49051
- Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion 16 p0485 A77-49052
- Large area Czochralski silicon for solar cells 16 p0486 A77-49054
- Low energy production processes in manufacturing of silicon solar cells 16 p0486 A77-49055
- Terrestrial concentrating photovoltaic power system studies 16 p0486 A77-49058
- CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications 16 p0486 A77-49059
- Basic mechanisms governing solar-cell efficiency 16 p0486 A77-49060
- CuInSe<sub>2</sub>/CdS thin film solar cells 16 p0486 A77-49062
- On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices 16 p0488 A77-49073
- On the analysis and design of grid structures for p-n junction solar cells 16 p0497 A77-49156
- MIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective coating 16 p0499 A77-49494
- Model calculations for metal-insulator-semiconductor solar cells 16 p0500 A77-50050
- N-CdS/n-GaAs voltage-enhanced photoanode --- in photoelectrochemical solar cell 16 p0503 A77-50287
- Efficient sprayed In<sub>2</sub>O<sub>3</sub>:Sn n-type silicon heterojunction solar cell 16 p0503 A77-50292
- Enhancement of diffusion length in EPG ribbon solar cells under illumination --- Edge-defined Film-fed Growth 16 p0503 A77-50293
- Cast polycrystalline silicon Schottky-barrier solar cells 16 p0503 A77-50295
- Space power stations - Space construction, transportation, and pre-development, space project requirements [IAF PAPER 77-64] 16 p0506 A77-51415

- LSSA (Low-cost Silicon Solar Array) project  
[NASA-CR-149091] 13 p0086 N77-10637
- Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell  
[PB-252409/8] 13 p0089 N77-10672
- Cadmium stannate selective optical films for solar energy applications  
[PB-254879/0] 13 p0090 N77-10678
- Industrial development of silicon solar cells  
[NASA-TT-F-17139] 13 p0097 N77-11528
- Applied research on II-VI compound  
[PB-254637/2] 13 p0098 N77-11547
- Semiconductor-electrolyte photovoltaic energy converter  
[PB-252837/0] 13 p0099 N77-11548
- Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513
- Status of silicon solar cell technology  
[NASA-TM-X-73531] 13 p0106 N77-12519
- The Redox flow system for solar photovoltaic energy storage  
[NASA-TM-X-73562] 13 p0106 N77-12522
- Analysis of epitaxial drift field N on P silicon solar cells  
[NASA-TM-X-73563] 13 p0106 N77-12523
- Low reflectivity solar cells  
[AD-A025922] 13 p0108 N77-12539
- Development of 20 percent efficient solar cell  
[PB-255903/7] 13 p0108 N77-12548
- Thin film solar cells for terrestrial applications  
[PB-255606/6] 13 p0109 N77-12553
- Results from the IMP-J violet solar cell experiment and violet cell balloon flights  
[NASA-TN-D-8393] 13 p0128 N77-15491
- Demonstration of the feasibility of automated silicon solar cell fabrication  
[NASA-CR-135095] 13 p0129 N77-15492
- Improved backwall cell  
[NASA-CASE-LEW-12236-1] 14 p0211 N77-17565
- Experimental study of the theoretical and technological possibilities to manufacture solar cells using GaInAs<sub>2</sub>-layers on GaAs-structures  
[BMFT-FE-W-76-10] 14 p0212 N77-17584
- High-efficiency thin-film GaAs solar cells  
[PB-258493/6] 14 p0212 N77-17599
- Studies of silicon p-n junction solar cells --- open circuit photovoltage  
[NASA-CR-149669] 14 p0215 N77-18557
- Investigation of low cost solar cells based on Cu<sub>2</sub>O  
[PB-258583/4] 14 p0217 N77-18582
- Investigation of low cost solar cells based on Cu<sub>2</sub>O  
[PB-258746/7] 14 p0217 N77-18583
- Navy applications for terrestrial photovoltaic solar power  
[AD-A030529] 14 p0218 N77-18590
- Research, development and pilot production of high output thin silicon solar cells  
[NASA-CR-149858] 14 p0219 N77-19573
- Optical materials for solar energy applications  
[SAND-76-5141] 14 p0224 N77-19628
- Photovoltaic II-VI compound heterojunctions for solar energy conversion  
[PB-259195/6] 14 p0251 N77-21702
- Method for producing solar energy panels by automation  
[NASA-CASE-LEW-12541-1] 15 p0344 N77-22615
- Silicon thin film crystallization and solar cell fabrication  
[PB-261715/7] 15 p0348 N77-22670
- Cadmium stannate selective optical films for solar energy applications  
[PB-261850/2] 15 p0348 N77-22672
- Development of an (AlGaAs-Ga As) graded band gap solar cell  
[NASA-CR-145161] 15 p0355 N77-23603
- Silicon Schottky photovoltaic diodes for solar energy conversion  
[PB-263172/9] 15 p0357 N77-23624
- Solar breeder: Energy payback time for silicon photovoltaic systems  
[NASA-CR-153060] 15 p0362 N77-24581
- Use of radiation reflected from earth to increase the power of solar panels  
15 p0363 N77-24586
- Development of a new silicon Schottky photovoltaic energy converter  
[PB-262491/4] 15 p0373 N77-25654
- Epitaxial silicon technology for low-cost solar cells  
[PB-262396/5] 15 p0374 N77-25663
- Laboratory evaluation of solar power units for marine aids to navigation  
[AD-A034987] 15 p0375 N77-25672
- Sensitivity of solar-cell performance to atmospheric variables. 1: Single cell  
[NASA-CP-2010] 15 p0378 N77-26623
- Sensitivity of solar-cell performance to atmospheric variables. 2: Dissimilar cells at several locations  
[NASA-CP-2010] 15 p0379 N77-26624
- Silicon solar cell development for concentrated-sunlight, high-temperature applications  
[SAND-76-5311] 15 p0380 N77-26647
- Effects of spectral variations on silicon cell output  
[SAND-76-9142] 15 p0381 N77-26653
- OTEC annual report to the Division of Solar Energy for FY-1976 and the transition quarter  
[BNWL-2154] 15 p0382 N77-26665
- Development of a high efficiency thin silicon solar cell  
[NASA-CR-153905] 15 p0391 N77-27502
- Automated array assembly task, phase 1  
[NASA-CR-153909] 15 p0391 N77-27505
- Ternary compound thin film solar cells - 1  
[PB-265003/4] 15 p0395 N77-27561
- Development of low cost thin film polycrystalline silicon solar cells for terrestrial applications  
[PB-266057/9] 16 p0517 N77-28618
- Development of standardized specifications for silicon solar cells  
[NASA-CR-135233] 16 p0520 N77-29604
- Energy programs at the Johns Hopkins University Applied Physics Laboratory  
[AD-A038096] 16 p0522 N77-29623
- Thin film solar cells for terrestrial applications  
[PB-265983/7] 16 p0523 N77-29635
- ERDA's central receiver solar thermal power system studies  
16 p0526 N77-30279
- Consideration of design and calibration of terrestrial reference solar cells  
16 p0527 N77-30531
- Sensitivity of solar cell performance to atmospheric variables. 1: Single cell  
16 p0527 N77-30534
- Cell and module test procedures seen from the manufacturer and the user point of view  
16 p0527 N77-30537
- Silicon solar cell testing in concentrated sunlight and simulated sunlight  
16 p0527 N77-30540
- Energy requirement for the production of silicon solar arrays  
[NASA-CR-153409] 16 p0528 N77-30604
- Development of low cost, high energy-per-unit-area solar cell modules  
[NASA-CR-153977] 16 p0528 N77-30605
- Solar silicon via improved and expanded metallurgical silicon technology  
[NASA-CR-153415] 16 p0528 N77-30606
- Horizontally mounted solar collector  
[NASA-CASE-MFS-23349-1] 16 p0529 N77-30613
- Solar cells and solar panels  
[AD-A039100] 16 p0529 N77-30621
- A solar power radiometer  
[AD-A039995] 16 p0539 N77-31658
- Evaluation of the CdS/CdTe heterojunction solar cell  
16 p0545 N77-32584
- Installation in Dakar of a pump powered by solar cell panels  
16 p0546 N77-32589
- Automated fabrication of back surface field silicon solar cells with screen printed wraparound contacts  
[NASA-CR-135202] 16 p0546 N77-32590
- Silicon Schottky photovoltaic diodes for solar energy conversion  
[PB-268457/9] 16 p0547 N77-32604
- Investigation of test methods, material properties and processes for solar cell encapsulants  
[NASA-CR-155158] 16 p0550 N77-33347
- Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature  
[NASA-CR-155166] 16 p0553 N77-33604

- Investigation of GaAs solar cell potential performance and cost  
[AD-A04736] 16 p0553 A77-33612
- SOLAR COLLECTORS**
- Ideal concentrators for finite sources and restricted exit angles --- parabolic solar collector  
13 p0003 A77-10835
- Solar energy --- conversion technology assessment  
13 p0006 A77-11037
- Plastics for solar-energy collectors. I - General aspects, hot-water collectors, design variants  
13 p0009 A77-11267
- Plastics for solar-energy collectors. II - Typical operational data and model parameters, functional diagrams, optimization of layer thicknesses  
13 p0009 A77-11269
- Design of a tracking system for a solar-energy installation  
13 p0015 A77-11919
- Radiant-vector distribution in the radiant field of a parabolocylindric concentrator  
13 p0015 A77-11920
- Calculations on an optimized faceted solar concentrator  
13 p0015 A77-11921
- A cylindrical blackbody solar energy receiver  
13 p0018 A77-12404
- A method of testing for rating solar collectors based on thermal performance  
13 p0019 A77-12408
- Optimal control of flow in low temperature solar heat collectors  
13 p0019 A77-12409
- Performance analysis of a cylindrical parabolic focusing collector and comparison with experimental results  
13 p0019 A77-12410
- A method for estimating hourly averages of diffuse and direct solar radiation under a layer of scattered clouds --- for solar collector design  
13 p0019 A77-12412
- Solar energy collection by bioconversion  
13 p0021 A77-12672
- Comparative performance of solar thermal power generation concepts  
13 p0036 A77-12803
- Economic optimization of the energy transport component of a large distributed solar power plant  
13 p0037 A77-12807
- Windowed versus windowless solar energy cavity receivers  
13 p0037 A77-12808
- Transient performance characteristics of a high temperature distributed solar collector field  
13 p0037 A77-12810
- Collector field optimization for a solar thermal electric power plant  
13 p0038 A77-12811
- Development of compound parabolic concentrators for solar-thermal electric and process heat applications  
13 p0038 A77-12812
- Evaluating a solar energy concentrator  
13 p0047 A77-13505
- Some material considerations involved in the application of solar energy to electric power generation  
13 p0049 A77-13739
- Practical aspects of solar heating - A review of materials use in solar heating applications  
13 p0049 A77-13743
- Characteristics of a system for transmitting concentrated solar radiation  
13 p0051 A77-14578
- Energetic calculation of the concentrating capacity of paraboloidal facets  
13 p0051 A77-14579
- Characteristic equations of unconcentrated flat solar cell panels  
13 p0052 A77-14929
- The problem of use of solar energy specific features of radiative, heat, and mass transfer in solar installations  
13 p0057 A77-16204
- Heat and mass transfer for solar energy utilization  
13 p0057 A77-16205
- Irradiation field formation on the receiver of 'precise' and 'unprecise' solar concentrators  
13 p0057 A77-16209
- A Cassegrain system for solar radiation  
13 p0063 A77-17561
- Application of solar energy in the high-temperature range  
13 p0063 A77-17636
- The application of aerospace technology to solar thermal electric power generation  
[AIAA PAPER 77-294] 13 p0065 A77-18226
- Parametric studies of the thermal trap flat plate collector  
13 p0068 A77-18443
- Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials  
13 p0068 A77-18444
- Axial conduction in a flat-plate solar collector  
13 p0068 A77-18447
- Use of Lexan and Kapton honeycombs to increase solar collector efficiency  
13 p0068 A77-18448
- Arrays of fixed flat-plate solar energy collectors - Performance comparisons for differing individual component orientations  
13 p0068 A77-18449
- Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors  
13 p0069 A77-18450
- A solar house with heat pipe collectors  
13 p0070 A77-18598
- Contribution to the study of solar energy collectors - Selective plates and cells  
13 p0072 A77-19051
- Progress in development and application of selective surfaces --- for solar collectors  
13 p0072 A77-19052
- Thin film solar acceptors  
13 p0072 A77-19053
- Temperature optimization for power production of infinite heat transfer solar absorbers  
13 p0073 A77-19055
- Procedure for characterizing flat plate solar collectors  
13 p0073 A77-19056
- Thermostatics and thermokinetics of a flat plate solar collector with constant heat capacity  
13 p0073 A77-19057
- Thermosole flat plate collectors  
13 p0073 A77-19058
- Performance of an annular cylindrical solar collector  
13 p0073 A77-19059
- Solergy collector concept --- immobile reflective surface for solar collection using spiral concentrator  
13 p0073 A77-19061
- Design and fabrication of solar concentrators  
13 p0074 A77-19062
- Captation and concentration of solar energy  
13 p0074 A77-19063
- An inflatable solar concentrator for a high temperature storage system  
13 p0074 A77-19064
- Performance of two fixed-mirror solar concentrators for process heat  
13 p0074 A77-19065
- Periodically adjustable concentrators adapted to solar cell panels  
13 p0074 A77-19068
- Stationary solar concentrators for industrial heating and cooling  
13 p0074 A77-19069
- A new method for collector field optimization --- computerized simulation of solar tower facility  
13 p0074 A77-19070
- Cylindrical mirror collector field  
13 p0074 A77-19071
- Design and performance of thermal storage water tank  
13 p0075 A77-19079
- Solar thermal power generation  
13 p0077 A77-19095
- Organic Rankine Cycle Engine development and solar energy utilization  
13 p0077 A77-19096

- Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106
- Factors affecting the use of solar energy for cooling 13 p0078 A77-19108
- Application of solar heat to buildings in Austria 13 p0079 A77-19114
- Lumiducts for Ecopclis --- urban solar light collection and transmission system 13 p0079 A77-19116
- Solar heating projects at the Institute for Environmental Research --- in Austria 13 p0079 A77-19119
- Research at the EURATOM-CCE Center --- on solar energy 13 p0080 A77-19126
- Annular-flow solar heater collector tubes [AIAA PAPER 77-190] 14 p0135 A77-19886
- Solar energy and electric utilities - Should they be interfaced 14 p0143 A77-21281
- The quality category in solar engineering 14 p0143 A77-21310
- Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312
- Investigation of composite radiant-energy concentrators with conical radiation sources 14 p0143 A77-21313
- Tower-type solar energy plant - Configuration and energy efficiency of concentrator 14 p0143 A77-21314
- Solar power from satellites 14 p0146 A77-21751
- International Conference on Solar Electricity, Toulouse, France, March 1-5, 1976, Reports 14 p0147 A77-21776
- The economic collection and efficient utilization of solar energy 14 p0147 A77-21778
- Antiloss cell structures - Coupling with a selective surface --- solar collector surface properties 14 p0148 A77-21790
- Antiloss cellular structures - The effect of the material cutoff wavelength --- of solar collectors 14 p0148 A77-21791
- A solar collector of glass 14 p0148 A77-21792
- Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation 14 p0149 A77-21794
- Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system 14 p0149 A77-21795
- Focusing collectors of solar radiation 14 p0150 A77-21808
- The ONERSOL collector and its performance --- solar energy conversion 14 p0150 A77-21809
- Tradeoff between selectivity and concentration in the collection of solar energy 14 p0150 A77-21810
- The thermodynamic cycle of the ONERSOL engine --- solar Rankine piston engine 14 p0152 A77-21829
- The solar tower as a source of thermal electric energy 14 p0152 A77-21831
- A study on solar tower power system 14 p0152 A77-21832
- Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost 14 p0154 A77-21845
- High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851
- Manufacture of plastic foam concentrators and their characteristics 14 p0154 A77-21852
- Solar heating and cooling 14 p0156 A77-22025
- Optical and thermal properties of Compound Parabolic Concentrators 14 p0157 A77-22641
- One MW/th/ bench model cavity receiver steam generator --- solar energy conversion system component 14 p0158 A77-22642
- Four different views of the heliostat flux density integral 14 p0158 A77-22645
- A comparison of solar absorption air conditioning systems 14 p0158 A77-22647
- Solar energy concentration with liquid lenses 14 p0158 A77-22649
- Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297
- Design and testing of planar solar collectors 14 p0164 A77-23298
- A mathematical model for the digital computation of the hours of sunshine on an inclined plane 14 p0166 A77-23382
- Periodically adjustable concentrators adapted to solar cell panels 14 p0166 A77-23385
- The University of Pennsylvania Solar Heating/Cooling System Program 14 p0167 A77-23439
- Design application using solar energy to control the environment in a major office building 14 p0168 A77-23442
- The use of commercially available absorption units on solar-powered cooling systems 14 p0168 A77-23445
- Initial test results for a solar-cooled townhouse in the mid-Atlantic region 14 p0170 A77-23655
- A practical solar concentrator 14 p0171 A77-23657
- Operational report on an integrated solar-assisted optimized heat pump system 14 p0171 A77-23658
- Gallium arsenide concentrator system [AIAA PAPER 77-487] 14 p0172 A77-23907
- Advanced low-mass solar array technology [AIAA PAPER 77-488] 14 p0173 A77-23908
- Method of designing profiles of focusing concentrators and focusing wedges --- for parabolic solar concentrators 14 p0179 A77-25355
- Experimental facility for measuring spatial and energy characteristics of solar concentrators 14 p0179 A77-25356
- Concentrating power of spherical facets 14 p0179 A77-25357
- Composite concentrators with spherical radiation sources 14 p0179 A77-25359
- Performance of low cost solar reflectors for transferring sunlight to a distant collector 14 p0180 A77-25896
- Operational modes of solar heating and cooling systems 14 p0180 A77-25899
- Cost optimal deployment of mirrors associated with a high temperature solar energy system 14 p0181 A77-25901
- Design of a solar heating and cooling system for CSU Solar House II 14 p0181 A77-25902
- Determination of average ground reflectivity for solar collectors 14 p0181 A77-25903
- Solar-optical analyses of a mass-produced plastic circular Fresnel lens 14 p0181 A77-25906
- Optimal overall efficiency for a solar radiation collector utilizing a two fluid Rankine Cycle to generate electrical power 14 p0182 A77-26056
- Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASME PAPER 76-WA/HT-10] 14 p0186 A77-26470
- Experimental evaluation of a cylindrical parabolic solar collector [ASME PAPER 76-WA/HT-13] 14 p0186 A77-26473
- Optical and thermal performance analysis of three line focus collectors [ASME PAPER 76-WA/HT-15] 14 p0186 A77-26475



# SUBJECT INDEX

# SOLAR COLLECTORS CONTD

Double-exposure collectors with mirrors for solar-heating systems  
 [ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476  
 A self-contained solar powered tracking device  
 [ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477  
 Performance of flat-plate collectors with planar reflectors  
 [ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478  
 Solar heating thermal storage feasibility  
 [ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483  
 A pressurized liquid concept for solar-thermal energy storage for the 24-hour continuous operation of an energy conversion system  
 [ASME PAPER 76-WA/HT-38] 14 p0187 A77-26484  
 Radiant transmittance of V-corrugated transparent sheets with application to solar collectors  
 [ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506  
 Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions  
 [ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508  
 Heat transfer considerations of a nonconvecting solar pond heat exchanger  
 [ASME PAPER 76-WA/SOL-4] 14 p0188 A77-26509  
 An economic analysis of thermic diode solar panels  
 [ASME PAPER 76-WA/SOL-7] 14 p0188 A77-26512  
 Solar heating in the United States  
 [ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513  
 The New Mexico Department of Agriculture solar heated and cooled building  
 [ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515  
 Development of compound parabolic concentrators for solar thermal applications  
 [ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516  
 Heat pipes in flat plate solar collectors  
 [ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517  
 Experimental measurements and system implications of the performance of flat plate solar collector configurations  
 [ASME PAPER 76-WA/SOL-14] 14 p0189 A77-26519  
 Performance evaluation on the Owens-Illinois Sunpack solar energy collector  
 [ASME PAPER 76-WA/SOL-16] 14 p0189 A77-26521  
 Optimal mass flow rates through flat plate solar collector panels  
 [ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524  
 Analysis of thermal performance of 'Solaris' water-trickle solar collector  
 [ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526  
 An experimental and analytical investigation of a solar water heater  
 [ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527  
 Thermal simulation of a building with solar assisted closed loop unitary heat pumps  
 [ASME PAPER 76-WA/SOL-23] 14 p0190 A77-26528  
 Indoor test methods to determine the effect of vacuum on the performance of a tubular flat plate collector --- for solar energy conversion  
 [ASME PAPER 76-WA/SOL-24] 14 p0190 A77-26529  
 Solar collectors - Technology and principles of operation  
 14 p0197 A77-28676  
 Plastics in systems of solar technology - A survey  
 14 p0197 A77-28677  
 Possibilities and economic limits concerning solar heating  
 14 p0197 A77-28679  
 Servo positioning power tower collectors for solar heat conversion to electricity  
 14 p0198 A77-28811  
 Evaluation of cadmium stannate films for solar heat collectors  
 14 p0198 A77-29021  
 Recent results in the research area 'energetics' with respect to nonnuclear energy research  
 14 p0200 A77-29300  
 Selective behavior and selective layer deposition in the case of light-transparent covers --- for solar collectors  
 14 p0202 A77-29564  
 The selectivity of absorbing layers --- of solar collector materials  
 14 p0202 A77-29565  
 Corrosion problems related to the employment of aluminum in collector construction  
 14 p0202 A77-29566  
 Collectors, pipelines, and heat storage units made of plastics  
 14 p0202 A77-29567

The consideration of climatic data in the prediction of solar-system performance --- for energy conversion  
 14 p0202 A77-29569  
 Heat transfer problems in flat plate collectors  
 14 p0202 A77-29570  
 The determination of the performance characteristics of solar collectors  
 14 p0203 A77-29573  
 Wavelength-selective surfaces for solar energy utilization  
 14 p0204 A77-29583  
 A comparison of solar photothermal coatings  
 14 p0204 A77-29584  
 Improved black nickel coatings for flat plate solar collectors  
 14 p0204 A77-29585  
 Development of solar tower program in the United States  
 14 p0204 A77-29591  
 Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber  
 14 p0204 A77-29594  
 Solar collectors using total internal reflections  
 14 p0204 A77-29596  
 Design application of the Hottel-Whillier-Bliss equation --- for flat-plate solar collector heat testing  
 15 p0255 A77-30309  
 Calculation of long term solar collector heating system performance  
 15 p0255 A77-30311  
 Solar-heated-air receivers --- of solar/gas turbine electrical generation plant design  
 15 p0255 A77-30312  
 Optimum solar collector operation for maximizing cycle work output  
 15 p0255 A77-30313  
 Design and performance studies on a solar room heater  
 15 p0255 A77-30314  
 Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data  
 15 p0256 A77-30315  
 Solar flux density distributions on central tower receivers  
 15 p0256 A77-30318  
 Non-focussing solar concentrators of easy manufacture  
 15 p0256 A77-30322  
 Optimization of silicon solar cell design for use under concentrated sunlight  
 15 p0257 A77-30714  
 Lighting with sunlight using sun tracking concentrators  
 15 p0260 A77-31245  
 Solar-thermal energy systems  
 15 p0262 A77-31472  
 Solar-thermal power systems  
 15 p0262 A77-31474  
 High level concentration of sunlight on silicon solar cells  
 15 p0267 A77-32208  
 Cooling with solar energy  
 15 p0268 A77-32401  
 Novel development for economic solar-energy utilization  
 15 p0268 A77-32402  
 A solar generator --- for cold-steam turbine operations  
 15 p0268 A77-32403  
 Inhibited ethylene glycol as the solar nexus  
 15 p0270 A77-32601  
 Corrosion prevention in aluminum solar systems  
 15 p0270 A77-32602  
 Corrosion problems in solar energy systems  
 15 p0270 A77-32603  
 Fabrication of solar energy concentrators based on polyurethane foams using new polyol and isocyanate compounds  
 15 p0271 A77-32973  
 Solar tower characteristics  
 15 p0274 A77-33333  
 Combination of focusing concentrators and focusing lenses  
 15 p0286 A77-33431

- The use of lasers for the inspection of heliotechnical reflectors 15 p0286 A77-33432
- Paraboloid-hyperboloid concentrating systems and their accuracy 15 p0286 A77-33433
- Applied solar energy: An introduction /2nd edition/ --- Book 15 p0286 A77-33445
- Features of systems for transmission of concentrated solar radiation 15 p0290 A77-34972
- Energy computation of concentrating capability of paraboloidal facets 15 p0290 A77-34973
- The sun-tracking control of solar collectors using high-performance step motors 15 p0291 A77-35030
- Solar properties of materials and testing of solar systems 15 p0294 A77-35318
- Solar energy prospects grow for US southwest 15 p0297 A77-36049
- Solar energy and energy storage --- French book 15 p0297 A77-36104
- 1-MW solar boiler tested 15 p0303 A77-36349
- Freeze protection for solar collectors 15 p0303 A77-36350
- Solar collection systems - The rationale 15 p0304 A77-36426
- Thermal storage - A sleeping giant 15 p0304 A77-36427
- Solar thermal systems --- solar farm and tower installations for domestic use 15 p0304 A77-36449
- 100 MWe solar power plant design configuration and performance [AAS 75-288] 15 p0305 A77-36556
- Active solar-heating systems for houses 15 p0306 A77-36724
- Solar shade control - New law for a new technology 15 p0306 A77-36764
- Solar energy, - A part of the answer 15 p0307 A77-36796
- Thermal analysis of some flat-plate solar collector designs for improving performance [AIAA PAPER 77-727] 15 p0311 A77-37252
- Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765
- Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators 15 p0316 A77-37767
- Concentration of scattered radiation --- by solar collectors 15 p0316 A77-37768
- Analysis of a faceted concentration system 15 p0316 A77-37769
- Solar energy systems of the tower type - Arrangement and heat-stability of the receivers and steam generators 15 p0316 A77-37770
- Conceptual design of a parabolic dish solar collector using simulation techniques 15 p0318 A77-38211
- On the optimum orientation of solar collectors 15 p0322 A77-38789
- Solar cell equipment with concentrating mirrors and radiator surfaces 15 p0324 A77-39494
- Application of solar energy in Belgium - Study of a flat plate collector --- Flemish book on materials, applications and design parameters 15 p0324 A77-39499
- Application of heat pipes to ground storage of solar energy [AIAA PAPER 77-729] 15 p0324 A77-39507
- Transmission solar focusing collector 15 p0334 A77-39671
- Solar collectors - Technology and principles of operation 15 p0335 A77-39977
- Plastics in systems of solar technology 15 p0336 A77-39979
- Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters 16 p0402 A77-41360
- Photovoltaic energy conversion using concentrated sunlight 16 p0402 A77-41516
- Integration of solar generation into electric utility systems [AIAA 77-1020] 16 p0404 A77-41562
- The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- A solar flux density calculation for a solar tower concentrator using a two-dimensional Hermite function expansion 16 p0405 A77-41578
- The effect of design and operating parameters on the performance of flat plate solar collectors - Calculation method and detailed appraisal 16 p0406 A77-41580
- Method for calculating the profiles of focones and foclines --- for parabolic solar concentrators 16 p0409 A77-41905
- Experimental setup for measuring space and energy characteristics of solar concentrators 16 p0409 A77-41906
- Concentrating capability of spherical facets --- for solar concentrator applications 16 p0409 A77-41907
- Composite concentrators with spherical radiation sources --- in solar heating systems 16 p0409 A77-41909
- Solar electricity - The hybrid system approach 16 p0413 A77-42556
- Solar power systems 16 p0416 A77-42895
- The geometry of catoptric light. II - An application to solar energy 16 p0417 A77-42959
- A tubular evacuated solar collector utilizing a heat pipe as absorber 16 p0417 A77-42961
- Studies into reduction of radiative heat losses of flat plate solar collectors 16 p0417 A77-42962
- Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern France 16 p0417 A77-42963
- Stratified density solar collection ponds - Physical factors, results of previous investigations, and suggested experiments 16 p0418 A77-42964
- Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors 16 p0418 A77-43049
- Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator 16 p0418 A77-43070
- Calculation of monthly average insolation on tilted surfaces 16 p0422 A77-44476
- Validity of the isotropic-distribution approximation in solar energy estimations 16 p0422 A77-44477
- A terrestrial solar thermal electric power system - Development of basic model system 16 p0422 A77-44478
- Correlation equation for hourly diffuse radiation on a horizontal surface --- insolation on solar collectors 16 p0422 A77-44481
- The effect of dropwise condensation on glass solar properties 16 p0422 A77-44485
- Efficient, low cost, concentrating solar collectors 16 p0423 A77-44486
- Solar absorption by each element in an absorber-coverglass array 16 p0423 A77-44487
- Comparison of predicted performance of constant outlet temperature and constant mass flow rate collectors --- for solar energy conversion 16 p0423 A77-44489
- Fundamental studies on heat storage of solar energy 16 p0423 A77-44490
- Selective absorbers for flat plate collectors 16 p0423 A77-44499
- Combination of focones and foclines with radiation receivers 16 p0427 A77-45544

## SUBJECT INDEX

## SOLAR COLLECTORS CONTD

Using lasers to inspect solar-energy reflectors  
16 p0427 A77-45545

Paraboloid-hyperboloid concentrating systems and their accuracy  
16 p0427 A77-45546

Circumferential variations of bore heat flux and outside surface temperature for a solar collector tube  
16 p0429 A77-46426

Some problems involved in the development of a solar thermionic power plant  
16 p0436 A77-47421

Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators  
16 p0437 A77-47423

Concentration of diffuse radiation --- by solar collectors  
16 p0437 A77-47424

Analyzing multifacet concentrating systems --- solar energy application  
16 p0437 A77-47425

A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators  
16 p0437 A77-47426

Solar energy installation for the project 'Motto di Lena' in Minusio/Tessin  
16 p0441 A77-48257

Shortened focusing concentrators and focusing wedges --- solar energy technology  
16 p0442 A77-48521

Contribution to procedures for testing Silazan resin coatings --- for solar concentrators  
16 p0443 A77-48522

Radiative heat transfer in cavity type axisymmetric collectors for high-temperature solar energy plants  
16 p0443 A77-48523

Solar powered steam generation  
16 p0459 A77-48832

High temperature solar collector with an Archimedes concentrator  
16 p0460 A77-48833

Development status of the fixed mirror solar concentrator  
16 p0460 A77-48834

Considerations for using solar concentrators in photovoltaic systems  
16 p0460 A77-48835

An assessment of mechanical energy storage for solar systems  
16 p0460 A77-48839

Dynamic modeling and sensitivity analysis of solar thermal energy conversion systems  
16 p0461 A77-48845

Deterministic insolation estimates for solar total energy systems  
16 p0462 A77-48847

Optimum operating conditions for a cylindrical parabolic focusing collector/Rankine power generation cycle system  
16 p0468 A77-48905

Space construction base operations in support of solar power satellite development  
16 p0468 A77-48907

The current technology for solar heating and cooling  
16 p0470 A77-48919

The climatology of available solar energy for Canada  
16 p0471 A77-48924

Determination of average ground reflectivity for solar collectors  
16 p0471 A77-48933

Methods for estimating total flux in the direct solar beam at any time  
16 p0471 A77-48934

Solar collectors --- for heating and cooling of buildings  
16 p0471 A77-48935

The use of planar reflectors for increasing the energy yield of flat-plate collectors  
16 p0472 A77-48937

Performance and analysis of 'Solaris' water-trickle solar collector  
16 p0472 A77-48939

Performance of an evacuated tubular collector using non-imaging reflectors  
16 p0472 A77-48940

A method of comparing flat-plate air and liquid solar collectors for use in space heating applications  
16 p0472 A77-48941

Performance of air-cooled flat plate collectors  
16 p0472 A77-48942

Predicted daily and yearly average radiative performance of optimal trapezoidal groove solar energy collectors  
16 p0472 A77-48943

Thermal, fluid flow and mechanical performance characteristics of a subatmospheric pressure, distributed flow flat plate collector  
16 p0473 A77-48945

A proposed method of rating the thermal performance of solar collectors  
16 p0473 A77-48946

A site sensitive solar collector evaluator  
16 p0473 A77-48947

Use of calculated displaced shapes to define the reflected light pattern from a focused collector  
16 p0473 A77-48948

Mathematical modeling of solar concentrators  
16 p0473 A77-48949

Design considerations for parabolic-cylindrical solar collectors  
16 p0473 A77-48950

Reduced drag, paraboloid type, solar energy collectors  
16 p0473 A77-48951

An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator  
16 p0473 A77-48952

Characteristics of the concentrated solar flux produced by the FMSC prototype --- Fixed Mirror Solar Concentrator  
16 p0474 A77-48953

Collector with cusplike compound parabolic concentrator and selective absorber  
16 p0474 A77-48955

Optical and thermal design considerations for ideal light collectors  
16 p0474 A77-48956

Solar process heat from concentrating flat-plate collectors  
16 p0474 A77-48957

A compound parabolic concentrator array optimized for northern climates --- cold weather effects on solar collectors  
16 p0474 A77-48958

Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures --- compatible with flat-plate solar collectors  
16 p0475 A77-48962

Comparative performance of solar heating with air and liquid systems  
16 p0475 A77-48967

Application of solar principles in designing a low cost system for warehouse heating  
16 p0476 A77-48969

A competitively-priced solar home, using concentrating collectors  
16 p0477 A77-48978

A non-technical evaluation of four different concrete wall solar collector configurations  
16 p0478 A77-48990

Solar retrofit of a home in Granton, Ontario  
16 p0479 A77-48995

A design procedure for solar air heating systems  
16 p0480 A77-49006

A simplified method for calculating required solar collector array size for space heating  
16 p0480 A77-49007

An averaging technique for predicting the performance of a solar energy collector system  
16 p0480 A77-49008

Minimum cost sizing of solar heating systems  
16 p0480 A77-49010

Cost effective solar heating of houses with seasonal storage of energy  
16 p0481 A77-49016

Solar thermal system requirements  
16 p0481 A77-49017

Solar energy for process heat  
16 p0481 A77-49020

Smith multimodule solar-electric plant  
16 p0482 A77-49023

- Solar pond stability experiments 16 p0482 A77-49028
- Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications 16 p0483 A77-49031
- Solar thermal electric power systems - Comparison of line focus collectors 16 p0483 A77-49032
- Technical feasibility of a modular dish solar electric system 16 p0483 A77-49034
- Solar flux density distributions on central tower receivers 16 p0484 A77-49038
- Extension of the Hottel-Whillier-Bliss model to the analysis of combined photovoltaic/thermal flat plate collectors 16 p0486 A77-49057
- The Alcoa 655 selective surface for aluminum --- for solar collectors 16 p0487 A77-49063
- Analytical and experimental treatment of a spray-on selective coating - Application to collector design 16 p0487 A77-49064
- Solar energy utilization, solid state science, and a high efficiency amorphous-silicon absorber 16 p0487 A77-49065
- The financial incentives for the fabrication of improved absorption coatings for the flat plate collector 16 p0487 A77-49066
- Considerations in the development of a high performance per unit cost solar collector 16 p0487 A77-49067
- Application of aluminum alloys for solar heating and cooling systems 16 p0487 A77-49068
- Use of getters in evacuated solar collectors 16 p0487 A77-49069
- The weatherability of solar energy utilization materials - Preliminary discussions 16 p0487 A77-49070
- Prisms with total internal reflection as solar reflectors 16 p0488 A77-49071
- Reflection coefficient for a back-surface glass mirror --- of solar collectors 16 p0488 A77-49072
- On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices 16 p0488 A77-49073
- Heat mirror - A practical alternative to the selective absorber 16 p0488 A77-49075
- Improved, inexpensive solar collectors for agricultural requirements 16 p0488 A77-49077
- Design and performance of an air collector for industrial crop dehydration 16 p0488 A77-49078
- Solar high technology and architecture 16 p0495 A77-49129
- Design factors for a cost effective solar collection system 16 p0496 A77-49143
- The performance of homemade solar collectors at the Stockton State College 'Energy House' 16 p0497 A77-49151
- Residential application of photovoltaic energy systems 16 p0497 A77-49155
- Fundamental studies of black chrome for solar collector use 16 p0498 A77-49160
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161
- Performance correlations of five solar collectors tested simultaneously outdoors 16 p0498 A77-49162
- An experimental investigation with artificial sunlight of a solar hot-water heater 16 p0498 A77-49163
- Solar energy conversion with fluorescent collectors 16 p0499 A77-49166
- Georgia Tech high temperature solar test facility 16 p0500 A77-49745
- On the study of applications of solar thermal energy for mobile homes 16 p0501 A77-50204
- The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation 16 p0501 A77-50206
- Heat transfer analysis of a flat-plate solar energy collector 16 p0501 A77-50207
- The solar spectrum at typical clear weather days --- for optimal energy conversion cell performance 16 p0501 A77-50212
- The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors 16 p0502 A77-50214
- Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219
- Effect of angular misorientation on the performance of conical, spherical and parabolic solar concentrators 16 p0502 A77-50221
- Fundamental research on heat transfer performances of solar focusing and tracking collector 16 p0502 A77-50223
- Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films --- of solar collectors 16 p0502 A77-50281
- Optical study of fixed spherical solar collectors 16 p0505 A77-51161
- High-efficiency solar concentrator 13 p0083 N77-10104
- A two-dimensional finite difference solution for the transient thermal behavior of tubular solar collector 13 p0083 N77-10105
- Solar hot water systems application to the solar building test facility and the Tech House 13 p0084 N77-10342
- Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638
- Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire [PB-254179/5] 13 p0091 N77-10687
- Optimized selective coatings for solar collectors [NASA-TM-X-73498] 13 p0097 N77-11529
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator [NASA-TM-X-73520] 13 p0097 N77-11530
- Solar radiation availability to various collector geometries: A preliminary study [SAND-76-0009] 13 p0097 N77-11537
- Solar power array for the concentration of energy. Task 2: Modifications to a specular photometer [COO-2699-3] 13 p0098 N77-11538
- Attic concentrator type solar energy collector [BNL-50493] 13 p0098 N77-11539
- Flat-plate solar collector handbook. A survey of principles, technical data and evaluation results [UCID-17086] 13 p0105 N77-12506
- Outdoor performance results for NBS Round Robin collector no. 1 [NASA-TM-X-73547] 13 p0106 N77-12520
- Standardized performance tests of collectors of solar thermal energy - A flat-plate copper collector with parallel mylar striping [NASA-TM-X-73553] 13 p0114 N77-13535
- Standardized performance tests of collectors of solar thermal energy: An evacuated flatplate copper collector with a serpentine flow distribution [NASA-TM-X-73415] 13 p0114 N77-13536
- Synergistic effects of shadowing on a solar collector matrix [SAND-76-0012] 13 p0122 N77-14587
- Performance correlations of five solar collectors tested simultaneously outdoors [NASA-TM-X-73546] 13 p0128 N77-15487
- A performance evaluation of various coatings, substrate materials, and solar collector systems [NASA-TM-X-73355] 13 p0128 N77-15489

## SUBJECT INDEX

## SOLAR COLLECTORS COMTD

- Solar collector manufacturing activity,  
January-June 1976  
[PB-258865/5] 14 p0208 N77-16455
- Solar cell collector and method for producing same  
--- indium alloy coatings  
[NASA-CASE-LEW-12552-1] 14 p0211 N77-17564
- Solar energy storage  
[AD-A028083] 14 p0213 N77-17605
- A non-tracking solar energy collector system  
[NASA-CASE-WFO-13813-1] 14 p0220 N77-19579
- Solar energy concentration  
[COO-2446-7] 14 p0220 N77-19584
- Optical materials for solar energy applications  
[SAND-76-5141] 14 p0224 N77-19628
- Central receiver solar thermal power system.  
Collector subsystem research experiments  
[SAN/1111-76/2] 14 p0225 N77-19649
- Weatherability of solar energy utilization  
materials: Preliminary discussions  
[CONF-760821-11] 14 p0225 N77-19650
- Mount for continuously orienting a collector dish  
in a system adapted to perform both diurnal and  
seasonal solar tracking  
[NASA-CASE-WFS-23267-1] 14 p0228 N77-20401
- An economic and performance design study of solar  
preheaters for domestic hot water heaters in  
North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- Application of a run around coil system to a roof  
fan house at Michoud Assembly Facility at New  
Orleans, Louisiana  
[NASA-CR-149887] 14 p0229 N77-20561
- Summary report of technical discussion, NASA-ERDA  
solar energy proposal  
14 p0229 N77-20562
- Summer performance results obtained from  
simultaneously testing ten solar collectors  
outdoors  
[NASA-TM-X-73594] 14 p0229 N77-20563
- Solar energy collection system  
[NASA-CASE-WFO-13579-2] 14 p0229 N77-20565
- Low cost solar energy collection system  
[NASA-CASE-WFO-13579-3] 14 p0229 N77-20566
- Solar absorption characteristics of several  
coatings and surface finishes --- for solar  
energy collectors  
[NASA-TM-X-3509] 14 p0229 N77-20567
- Central receiver solar thermal power system,  
collector subsystem  
[SAN/1111-75/1] 14 p0230 N77-20576
- Central receiver solar thermal system, phase 1,  
CPRL item 10  
[SAN/1108-76/2] 14 p0231 N77-20591
- Performance and analysis of SOLARIS water-trickle  
solar collector  
[CONF-760821-9] 14 p0232 N77-20599
- The cylindrical parabolic mirror as reflector for  
solar collectors. Efficiencies and optimization  
[DKE-PB-76-55] 14 p0233 N77-20607
- EPA Van operational manual  
[PB-259177/4] 14 p0233 N77-20608
- Evaluation of the solar heating system in the Lof  
residence, Denver, Colorado  
[PB-258845/7] 14 p0233 N77-20617
- The evaluation of surface geometry modification to  
improve the directional selectivity of solar  
energy collectors  
[PB-258848/1] 14 p0233 N77-20618
- Central receiver solar thermal power system, phase 1  
[SAN/1110-76/T2] 14 p0248 N77-21668
- Transparent glass honeycomb structures for energy  
loss control --- for solar collectors  
[SAN/1084-75/1] 14 p0248 N77-21673
- Optical and thermal characteristics of a solar  
collector with a stationary spherical reflector  
and a tracking absorber  
[SAND-76-8663] 14 p0248 N77-21674
- Technical and economic feasibility of solar  
augmented process steam generation  
[COO-2732-1] 14 p0250 N77-21692
- A lightweight solar array study  
[NASA-CR-152676] 15 p0343 N77-22611
- Prisms with total internal reflection as solar  
reflectors  
[ANL-SOL-76-04] 15 p0345 N77-22629
- Focused solar collector analysis with axially  
varying input due to shadowing from adjacent  
collectors  
[SAND-76-5061] 15 p0345 N77-22635
- Potential of a solar collector with a stationary  
spherical reflector and a tracking absorber for  
electrical power production  
[SAND-76-8039] 15 p0345 N77-22636
- Silicon thin film crystallization and solar cell  
fabrication  
[PB-261715/7] 15 p0348 N77-22670
- Two investigations of flat-plate solar collector  
performance  
15 p0355 N77-23598
- Analysis of the sun pumped laser cone optics  
[AD-A034284] 15 p0361 N77-24483
- Baseline performance of solar collectors for NASA  
Langley solar building test facility  
[NASA-TM-X-3505] 15 p0363 N77-24587
- An economic analysis of solar water and space  
heating  
[DSE/2322-1] 15 p0363 N77-24588
- Sun tracking solar energy collector  
[NASA-CASE-WFO-13921-1] 15 p0363 N77-24590
- Method for fabricating solar cells having integral  
collector grids  
[NASA-CASE-LEW-12819-1] 15 p0363 N77-24593
- Evaluation of an all-glass, evacuated, tubular,  
non-focusing, non-tracking solar collector array  
[TID-27192] 15 p0364 N77-24600
- The cylindrical parabolic mirror as reflector for  
solar collectors-efficiencies and optimization  
[ESA-TT-365] 15 p0365 N77-24615
- Development of plastic honeycomb flat-plate solar  
collectors  
[SAN/1081-76/1] 15 p0372 N77-25640
- Optical study of fixed spherical solar collectors  
[LAS-PRC-76-01] 15 p0373 N77-25653
- Predicting the performance of solar energy systems  
[AD-A035608] 15 p0373 N77-25660
- Assembly and testing of a 1.8 by 3.7 meter Fresnel  
lens solar concentrator  
[NASA-CR-150300] 15 p0378 N77-26610
- Evaluation of initial collector field performance  
at the Langley Solar Building Test Facility  
[NASA-TM-X-73677] 15 p0378 N77-26617
- Analysis of thermal performance of Solaris  
water-trickle solar collector  
[CONF-761107-17] 15 p0382 N77-26668
- Evaluation of Solaris water-trickle solar  
collector and demonstration of annual cycle  
collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 N77-26669
- Study of corrosion and its control in aluminum  
solar collectors  
[COO-2934-76-1] 15 p0383 N77-26673
- Calculation of monthly average insolation on  
tilted surfaces  
[CONF-760842-15] 15 p0387 N77-27057
- Photovoltaic-powered refrigerator experiment at  
Isle Royale National Park  
[NASA-TM-73703] 15 p0390 N77-27497
- Engineering analysis and testing of water-trickle  
solar collector  
[ORO-4927-76-2] 15 p0391 N77-27506
- Design problems associated with the use of  
evacuated glass receivers for solar collectors  
[CONF-7606128-1] 15 p0393 N77-27536
- Instrumentation for measuring direct and diffuse  
insolation in testing thermal collectors  
[CONF-760832-23] 15 p0394 N77-27545
- Central receiver solar thermal power system, phase 1  
[SAN/1110-76/1] 15 p0394 N77-27550
- Studies on methods of reducing heat losses from  
flat plate solar collectors  
[COO-2597-2] 15 p0395 N77-27554
- A non-tracking solar energy collector system  
[NASA-CASE-WFO-13817-1] 16 p0513 N77-28583
- Market evaluation study: Solar domestic water  
heaters for DOD barracks  
[AD-A036479] 16 p0516 N77-28611
- The linear Fresnel lens solar concentrator:  
Transverse tracking error effects  
[NASA-CR-2889] 16 p0521 N77-29606
- Solar concentration by curved-base Fresnel lenses  
[NASA-CR-2890] 16 p0524 N77-29946
- ERDA's central receiver solar thermal power system  
studies  
16 p0526 N77-30279
- Processing on high efficiency solar collector  
coatings  
16 p0526 N77-30286

- An analytical and experimental investigation of a 1.8 by 3.7 meter Fresnel lens solar concentrator [NASA-TP-1005] 16 p0529 N77-30617
- Solar cells and solar panels [AD-A039100] 16 p0529 N77-30621
- Assessment of a single-family residence solar heating system in a suburban development setting. Project Phoenix [PB-263192/7] 16 p0530 N77-30632
- Solar cell shingle [NASA-CASE-LEW-12587-1] 16 p0534 N77-31601
- Aluminum or copper substrate panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-1] 16 p0535 N77-31610
- Stainless steel panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-2] 16 p0535 N77-31611
- Solar Collection Module Test Facility, instrumentation fluid loop number one [SAND-76-0425] 16 p0535 N77-31619
- Solar energy collection system [NASA-CASE-NPO-13810-1] 16 p0545 N77-32582
- Three-dimensional tracking solar energy concentrator and method for making same [NASA-CASE-NPO-13736-1] 16 p0545 N77-32583
- Radiative characteristics of metallic particle coatings and their applications in selective solar energy collectors 16 p0545 N77-32587
- North View Junior High School solar energy demonstration project [PB-267447/1] 16 p0548 N77-32612
- Solar collector manufacturing activity [PB-266985/1] 16 p0558 N77-33664
- SOLAR COOLING**
- A data acquisition, performance evaluation and monitoring system for solar heated/cooled residential dwellings [ASME PAPER 76-WA/SOL-13] 14 p0189 A77-26518
- Solar heating and cooling and energy conservation potentials for commercial buildings [ASME PAPER 76-WA/SOL-17] 14 p0189 A77-26522
- Study of an absorption solar refrigeration unit functioning on a round-the-clock basis 15 p0316 A77-37772
- Answer House story --- utilizing solar cooling and solar heating 15 p0333 A77-39664
- Possibilities for the solar air conditioning of buildings 15 p0335 A77-39978
- The architecture of a passive system of diurnal radiation heating and cooling 16 p0423 A77-44488
- Lessons learned from Atlanta /towns/ solar experiment --- solar heating and cooling for school 16 p0423 A77-44491
- Earth, an open system - The use of solar energy 16 p0432 A77-46788
- Investigation of solar absorption cooler for round-the-clock operation 16 p0437 A77-47428
- Residential solar heating in Uzbekistan 16 p0437 A77-47430
- Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications 16 p0450 A77-48756
- The Page-Jackson Elementary School solar heating and cooling system 16 p0462 A77-48851
- Development and implementation of standards for solar heating and cooling applications 16 p0469 A77-48913
- Solar residential demonstration program 16 p0469 A77-48914
- The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report 16 p0470 A77-48918
- The current technology for solar heating and cooling 16 p0470 A77-48919
- Prospectus on commercialization of solar heating and cooling systems 16 p0470 A77-48920
- Parametric study of a dynamic solar powered absorption cycle 16 p0475 A77-48961
- Modelling of a solar-operated absorption air conditioner system with refrigerant storage 16 p0475 A77-48963
- Cooling subsystem design in CSU Solar House III 16 p0475 A77-48964
- Coefficient of performance for solar-powered space cooling systems 16 p0475 A77-48965
- A solar heated and cooled office building 16 p0475 A77-48966
- Lessons learned from Atlanta /Towns/ solar experiment --- school building heating and cooling system 16 p0476 A77-48971
- Solar cooling of a Florida Welcome Station - A demonstration 16 p0476 A77-48973
- The Shenandoah Solar Community Center 16 p0476 A77-48974
- Solar heating and cooling in a commercial building 16 p0477 A77-48983
- An analysis on optimal design of solar heating and cooling system for school 16 p0477 A77-48984
- Steady-state and transient performance limitations of the ARKLA Solair absorption cooling system 16 p0478 A77-48987
- Application of aluminum alloys for solar heating and cooling systems 16 p0487 A77-49068
- Incentives and barriers to the development of solar energy 16 p0494 A77-49119
- Report on the design, construction, and marketing of two solar heated SPEC houses 16 p0496 A77-49141
- Commercialization of solar heating and cooling of buildings 16 p0496 A77-49142
- Solar air conditioning applications for warm humid climate 16 p0496 A77-49147
- The design of a solar cooling and heating system for a commercial building 16 p0497 A77-49148
- Dual Phase Annual Cycle for residential heating and cooling --- by solar energy 16 p0497 A77-49149
- Solar economics in Illinois 16 p0497 A77-49152
- Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists 16 p0497 A77-49157
- Initial operation of a solar heating and cooling system in a full-scale solar building test facility 16 p0498 A77-49164
- Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation 16 p0498 A77-49165
- General Electric Company survey to define impact of statewide building codes on solar HVAC systems, commercial buildings. National Solar Demonstration Program [COO-2683-76-11] 15 p0383 N77-26674
- SOLAR CORPUSCULAR RADIATION**
- Combined studies of the sun and isotope ecology 15 p0271 A77-32868
- SOLAR ELECTRIC PROPULSION**
- SEP solar array technology development 13 p0040 A77-12825
- Comparison of candidate solar array maximum power utilization approaches --- for spacecraft propulsion 13 p0041 A77-12836
- NASA electric propulsion program [AIAA PAPER 76-1068] 13 p0045 A77-13033
- SEP full-scale wing technology development 16 p0463 A77-48860
- SOLAR ENERGY**
- Photovoltaic and thermal energy conversion for solar powered satellites [IAF PAPER 76-117] 13 p0003 A77-10913

## SUBJECT INDEX

## SOLAR ENERGY CONTD

- Satellite power systems for large-scale power generation  
[IAF PAPER 76-118] 13 p0003 A77-10914
- Prospects for solar energy utilization in Iran - Photothermal methods 13 p0013 A77-11532
- Accelerated response of thermopile pyranometers 13 p0019 A77-12405
- Hydrogen from solar energy via water electrolysis 13 p0032 A77-12771
- The nuclear spinner for Satcom applications --- comparing nuclear and solar power supplies 13 p0041 A77-12838
- Characteristics of a system for transmitting concentrated solar radiation 13 p0051 A77-14578
- Theoretical maximum for energy from direct and diffuse sunlight 13 p0064 A77-17845
- Hydel and solar power for Pakistan --- hydroelectric power 13 p0079 A77-19121
- Geothermal energy in Saudi Arabia and its use in connection with solar energy 13 p0079 A77-19122
- Improved use of energy --- through waste and solar energy utilization 13 p0079 A77-19123
- Research at the EURATOM-CCF Center --- on solar energy 13 p0080 A77-19126
- Solar photothermal power generation 14 p0146 A77-21700
- Photovoltaic conversion of solar energy using optical concentration systems 14 p0154 A77-21849
- Economic competitiveness of solar energy with conventional fuels and electricity 14 p0158 A77-22648
- Why solar energy --- advantages over fossil fuel and nuclear energy 14 p0170 A77-23654
- Principles of solar technology I; Meeting, 2nd, Stuttgart, West Germany, October 22, 1976, Reports 14 p0201 A77-29562
- Thermal energy storage --- in building elements, water and rock beds 15 p0264 A77-31698
- Features of systems for transmission of concentrated solar radiation 15 p0290 A77-34972
- Statistical utility theory for comparison of nuclear versus fossil power plant alternatives 15 p0291 A77-35015
- Simple thermal decomposition reactions for storage of solar thermal energy 15 p0292 A77-35153
- Energy and aerospace /Sixty-fifth Wilbur and Orville Wright Memorial Lecture/ --- aerospace contributions to energy conservation 15 p0304 A77-36434
- Solar energy: Applications, systems, experience; Lecture and Discussion Meeting, Essen, West Germany, February 4, 1977, Reports 15 p0335 A77-39976
- The prospects for renewable energy sources 16 p0415 A77-42858
- Hydrogen and oxygen from water 16 p0430 A77-46573
- Space and energy; Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975 16 p0432 A77-46787
- Radiative heat transfer in cavity type axisymmetric collectors for high-temperature solar energy plants 16 p0443 A77-48523
- Experience in constructing a solar energy cadastral survey 16 p0443 A77-48525
- Commercial applications of solar total energy systems 16 p0468 A77-48904
- Sharing the sun: Solar technology in the seventies; Proceedings of the Joint Conference, Winnipeg, Canada, August 15-20, 1976. Volumes 1-10 16 p0469 A77-48910
- Solar powered absorption air-conditioning system performance using real and synthetic weather data 16 p0479 A77-49002
- Site Data Collection System for solar energy applications 16 p0480 A77-49014
- Fuels and chemicals from the sun through bioconversion 16 p0488 A77-49076
- Application of chemical engineering to large scale solar energy 16 p0491 A77-49098
- Solar energy and urban settlements 16 p0494 A77-49127
- Solar energy: A U.K. assessment --- Book 16 p0503 A77-50688
- Development of new technologies for energy production in the Federal Republic of Germany 16 p0505 A77-51157
- Direct solar energy conversion for large scale terrestrial use --- using CdS/Cu<sub>2</sub>S solar cell [PB-252539/2] 13 p0089 A77-10674
- Solar radiation availability to various collector geometries: A preliminary study [SAND-76-0009] 13 p0097 A77-11537
- Measured performance of a 3 ton LiBr absorption water chiller and its effect on cooling system operation [NASA-TN-X-73496] 13 p0105 A77-12518
- Definition study for photovoltaic residential prototype system [NASA-CR-135039] 13 p0113 A77-13532
- Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [DLR-FB-76-32] 13 p0114 A77-13541
- Method for estimating solar heating and cooling system performance [AD-A026041] 13 p0116 A77-13557
- Explaining energy: A manual of non-style for the energy outsider who wants in [LBL-4458] 13 p0122 A77-14592
- Interim feasibility assessment method for solar heating and cooling of Army buildings [AD-A026588] 13 p0124 A77-14606
- Analysis of the technical and cost feasibility of solar and/or wind energy systems for Coast Guard public quarters [AD-A028332] 14 p0209 A77-16460
- Feasibility of heating domestic hot water for apartments with solar energy [AD-A028418] 14 p0209 A77-16461
- Solar total energy program [SAND-76-0205] 14 p0211 A77-17571
- A survey of state legislation relating to solar energy [PB-258235/1] 14 p0213 A77-17600
- Solar energy storage [AD-A028083] 14 p0213 A77-17605
- Space solar power systems 14 p0213 A77-17690
- Central receiver solar thermal power system, phase 1 [SAR/1110-76/T1] 14 p0216 A77-18570
- Solar pilot plant, phase 1 [SAR/1109-76/T1] 14 p0216 A77-18571
- Utilization of solar energy [ERDA-TB-144] 14 p0216 A77-18572
- General Electric Company study for defining the number of residential and non-residential projects, National Solar Demonstration Program [COO-2683-76-7] 14 p0217 A77-18579
- Solar energy concentration [COO-2446-7] 14 p0220 A77-19584
- National plan for energy research, development and demonstration: Creating energy choices for the future. Volume 2: Program implementation --- fossil fuels, solar energy, and geothermal energy [ERDA-76-1-VOL-2] 14 p0222 A77-19600
- Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations [AD-A031163] 14 p0226 A77-19662
- Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations. Appendixes A, B, and C [AD-A031164] 14 p0226 A77-19663
- Solar energy: L-division miscellaneous [UCID-17177] 14 p0231 A77-20590

- Status of Goldstone solar energy system study of the first Goldstone energy project 14 p0235 N77-21126
- Solar tower characteristics 14 p0237 N77-21562
- Synthetic fuels from solid wastes and solar energy 14 p0237 N77-21565
- Covered energy farms for solar energy conversion [LBL-4844] 14 p0248 N77-21671
- Technical and economic feasibility of solar augmented process steam generation [COO-2732-1] 14 p0250 N77-21692
- Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [ESA-TT-338] 14 p0251 N77-21701
- Solar energy in buildings: Implications for California energy policy [NASA-CR-152686] 15 p0343 N77-22613
- Method for producing solar energy panels by automation [NASA-CASE-LEW-12541-1] 15 p0344 N77-22615
- Solar energy environmental and resource assessment program [ERDA-76-138] 15 p0344 N77-22621
- Buying solar --- consumer information [PB-262134/0] 15 p0348 N77-22673
- Solar energy government buildings program policy and implementation plan [PB-262841/0] 15 p0366 N77-24622
- The effectiveness of solar energy incentives at the state and local level [PB-263371/7] 15 p0375 N77-25670
- Laboratory evaluation of solar power units for marine aids to navigation [AD-A034987] 15 p0375 N77-25672
- Hydration-dehydration cycling of MgO-Mg(OH)2 for application to solar heat storage systems [AI-ERDA-13178] 15 p0381 N77-26654
- Calculation of monthly average insolation on tilted surfaces [CONF-76C842-15] 15 p0387 N77-27057
- Central receiver solar thermal power system, phase 1 [SAN/1110-76/2] 15 p0394 N77-27551
- Biosolar production of fuels from algae [UCRL-52177] 16 p0511 N77-28323
- Total energy systems: Solar energy program [SAND-76-5758] 16 p0514 N77-28591
- Solar energy and electric utilities: Can they be interfaced? [ANL-ES-52] 16 p0515 N77-28601
- National program for solar heating and cooling of buildings [ERDA-76-6] 16 p0515 N77-28604
- Project SAGE: Solar Assisted Gas Energy Project. United States special format report [DSE/4691-76/1] 16 p0522 N77-29614
- Forecast of likely US energy supply/demand balances for 1985 and 2000, and implications for US energy policy [PB-266240/1] 16 p0523 N77-29633
- ERDA's central receiver solar thermal power system studies 16 p0526 N77-30279
- Research on the application of solar energy to the food drying industry [PB-267210/3] 16 p0530 N77-30635
- Aluminum or copper substrate panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-1] 16 p0535 N77-31610
- Solar energy applications and related legislation [PB-267901/7] 16 p0539 N77-31666
- Solar photolysis of water [NASA-CASE-NPO-13675-1] 16 p0544 N77-32580
- Three-dimensional tracking solar energy concentrator and method for making same [NASA-CASE-NPO-13736-1] 16 p0545 N77-32583
- North View Junior High School solar energy demonstration project [PB-267447/1] 16 p0548 N77-32612
- Solar energy: Policy and prospects [PB-267986/8] 16 p0554 N77-33620
- Advanced Thermal Energy Storage (TES) systems [EPRI-EH-256-SY] 16 p0555 N77-33622
- Technical and economic feasibility of solar augmentation for boiler feedwater heating in steam-electric power plants [COO-2864-1] 16 p0555 N77-33626
- Proceedings of the ERDA Semiannual Solar photovoltaic Program Review Meeting [CONF-760837-P2] 16 p0555 N77-33628
- Solar radiation availability for New Mexico [SAND-77-0004] 16 p0558 N77-33654
- Ecological considerations of the solar alternatives [LBL-5927] 16 p0558 N77-33655
- SOLAR ENERGY ABSORBERS**
- Effect of optical properties of a surface exposed to solar radiation on the radiation balance 13 p0052 A77-14928
- Study of emittance distribution along the walls of a cellular low-loss cell in the case of a base surface with arbitrary emission indicatrix 13 p0069 A77-18495
- Thin film solar acceptors 13 p0072 A77-19053
- Efficiency tests on a linear parabolic concentrator for medium and high temperatures 13 p0077 A77-19103
- Selection of optimal pan color for solar water heater 13 p0078 A77-19104
- Focusing collectors of solar radiation 14 p0150 A77-21808
- Study of a heliostat system for a solar thermal converter with an energy of 10 MW 14 p0150 A77-21811
- A comparison of solar absorption air conditioning systems 14 p0158 A77-22647
- Particulate nature of solar absorbing films - Gold black 14 p0163 A77-22982
- Solar absorption air-conditioning performance in central Ohio 14 p0168 A77-23443
- The use of commercially available absorption units on solar-powered cooling systems 14 p0168 A77-23445
- Relationship between heat source temperature, heat sink temperature and coefficient of performance for solar-powered absorption air conditioners 14 p0168 A77-23446
- Selecting refrigerant-absorbent fluid systems for solar energy utilization 14 p0168 A77-23448
- Continuous solar air conditioning with ammonia/water absorption cycle 14 p0182 A77-26057
- Heat pipes in flat plate solar collectors [ASHE PAPER 76-WA/SOL-12] 14 p0189 A77-26517
- Performance evaluation on the Owens-Illinois Sunpack solar energy collector [ASHE PAPER 76-WA/SOL-16] 14 p0189 A77-26521
- Solar heating and cooling and energy conservation potentials for commercial buildings [ASHE PAPER 76-WA/SOL-17] 14 p0189 A77-26522
- Plastics in systems of solar technology - A survey 14 p0197 A77-28677
- The selectivity of absorbing layers --- of solar collector materials 14 p0202 A77-29565
- Corrosion problems related to the employment of aluminum in collector construction 14 p0202 A77-29566
- Heat transfer problems in flat plate collectors 14 p0202 A77-29570
- Design application of the Hottel-Whillier-Bliss equation --- for flat-plate solar collector heat testing 15 p0255 A77-30309
- Applications of thin graded-index films to solar absorbers 15 p0260 A77-31244
- Selective black absorbers using RF-sputtered Cr2O3/Cr cermet films 15 p0265 A77-31951
- Novel development for economic solar-energy utilization 15 p0268 A77-32402
- Corrosion problems in solar energy systems 15 p0270 A77-32603
- Heat mirrored solar energy receivers [AIAA PAPER 77-728] 15 p0324 A77-39506



# SUBJECT INDEX

# SOLAR ENERGY CONVERSION

- Use of adsorbent beds for energy storage in drying of heating systems 16 p0405 A77-41577
- Ellipsometry in the study of selective radiation-absorbing surfaces --- for solar energy 16 p0406 A77-41581
- A new Chrome Black selective absorbing surface --- for solar radiation 16 p0406 A77-41585
- A tubular evacuated solar collector utilizing a heat pipe as absorber 16 p0417 A77-42961
- Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator 16 p0418 A77-43070
- On the performance of cylindrical parabolic solar concentrators with flat absorbers 16 p0422 A77-44484
- Solar absorption by each element in an absorber-coverglass array 16 p0423 A77-44487
- Spectral reflectance of TiN/x/ and ZrN/x/ films as selective solar absorbers 16 p0423 A77-44492
- Selective absorbers for flat plate collectors 16 p0423 A77-44499
- A heat transfer criterion on the geometric configuration of flat solar water heaters 16 p0472 A77-48944
- The performance of a stationary reflector/tracking absorber solar concentrator 16 p0474 A77-48954
- Fermi function model absorption profile for solar-thermal conversion 16 p0483 A77-49035
- Fundamental studies of black chrome for solar collector use 16 p0498 A77-49160
- Natural convection phenomena in inclined cells with finite side-walls - A numerical solution --- solar energy absorption cells 16 p0500 A77-50201
- The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors 16 p0502 A77-50214
- Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219
- Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638
- Two component thermal energy storage material [PB-252592/1] 13 p0090 N77-10675
- Testing and fabrication of solar absorbers for the D5A' satellite [CNES-WT-37] 13 p0111 N77-13110
- A non-tracking solar energy collector system [NASA-CASE-NPO-13813-1] 14 p0220 N77-19579
- Optical materials for solar energy applications [SAND-76-5141] 14 p0224 N77-19628
- Investigation of high temperature performance of thin film, solar-thermal energy converters [PB-265554/6] 16 p0516 N77-28613
- Solar cell shingle [NASA-CASE-LEW-12587-1] 16 p0534 N77-31601
- Stainless steel panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-2] 16 p0535 N77-31611
- SOLAR ENERGY CONVERSION**
- The options for using the sun 13 p0001 A77-10318
- R&M - Today's heating and cooling vs. solar energy 13 p0002 A77-10482
- Energy - Ecospace --- space law aspects of U.S. and U.S.S.R. solar power proposals [IAF PAPER ISL-76-59] 13 p0004 A77-10970
- Solar energy --- conversion technology assessment 13 p0006 A77-11037
- A multilayer iron-thionine photogalvanic cell 13 p0007 A77-11108
- Energy: A radical redirection 13 p0010 A77-11275
- Isothermal surface in a radiation field --- in solar thermal energy devices 13 p0014 A77-11918
- Near-uv photon efficiency in a TiO2 electrode - Application to hydrogen production from solar energy 13 p0015 A77-11947
- Coming - Solar power plants 13 p0016 A77-12125
- The long-range prospects for solar energy 13 p0017 A77-12237
- The long-range prospects for solar-derived fuels 13 p0017 A77-12240
- Law and solar energy systems - Legal impediments and inducements to solar energy systems 13 p0018 A77-12401
- Developments in solar energy utilisation in the United Kingdom 13 p0018 A77-12402
- Solar water pump for lift irrigation 13 p0019 A77-12406
- Energy conversion via photoelectrolysis 13 p0021 A77-12667
- Solar energy collection by bioconversion 13 p0021 A77-12672
- Thermochemical energy storage systems 13 p0028 A77-12738
- An evaluation of the use of metal hydrides for solar thermal energy storage 13 p0028 A77-12739
- HYCSOS - A solar heating, cooling and energy conversion system based on metal hydrides 13 p0029 A77-12740
- Solar powered organic Rankine cycle engines - Characteristics and costs 13 p0036 A77-12798
- Comparative performance of solar thermal power generation concepts 13 p0036 A77-12803
- Solar thermal electric power plants - Their performance characteristics and total social costs 13 p0037 A77-12804
- Solar energy prospects for electric power generation in Brazil 13 p0037 A77-12805
- Central station solar electric power using liquid metal heat transport 13 p0037 A77-12806
- Economic optimization of the energy transport component of a large distributed solar power plant 13 p0037 A77-12807
- Windowed versus windowless solar energy cavity receivers 13 p0037 A77-12808
- The role of simulation in the development of solar-thermal energy conversion systems 13 p0037 A77-12809
- A fixed collector employing reversible vee-trough concentrator and a vacuum tube receiver for high temperature solar energy systems 13 p0038 A77-12813
- Calorimetry of large solar concentrators 13 p0038 A77-12814
- The ERDA Photovoltaic Systems Definition Project 13 p0038 A77-12815
- Performance and cost analysis of photovoltaic power systems for on-site residential applications 13 p0038 A77-12816
- New concepts in solar photovoltaic electric power systems design 13 p0038 A77-12817
- Long term performance prediction of residential solar energy heating systems 13 p0039 A77-12822
- Experimental evaluation of the University of Florida solar powered ammonia/water absorption air conditioning system 13 p0039 A77-12823
- Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data 13 p0039 A77-12824
- Life-cycle costs and solar energy 13 p0047 A77-13501
- Optimizing solar cooling systems 13 p0047 A77-13502
- Atlanta /Towns/ solar experiment - The lessons we learned 13 p0047 A77-13503

Evaluating a solar energy concentrator 13 p0047 A77-13505

The Shenandoah Community Center - A total solar design concept 13 p0047 A77-13506

Hydrogen production using solar radiation 13 p0048 A77-13540

Some material considerations involved in the application of solar energy to electric power generation 13 p0049 A77-13739

Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up --- utilizing Stirling engine 13 p0051 A77-14580

Utilization of solar power - A new departure 13 p0053 A77-15049

Cost aspects of solar energy - Selective and critical bibliography 13 p0054 A77-15799

The problem of use of solar energy specific features of radiative, heat, and mass transfer in solar installations 13 p0057 A77-16204

Transient behavior of solid sensible heat thermal storage units for solar energy systems 13 p0057 A77-16208

A central solar energy utilization system 13 p0057 A77-16210

Photovoltaic conversion of solar energy 13 p0058 A77-16368

Application of solar energy in the high-temperature range 13 p0063 A77-17636

The economic viability of pursuing a space power system concept [AIAA PAPER 77-353] 13 p0066 A77-18258

Study and materialization of a selective surface designed for direct thermal conversion of solar energy - Application to medium temperature range 13 p0069 A77-18496

The future importance of solar energy for the supply of the German Federal Republic with energy 13 p0070 A77-18597

Chemical evolution of photosynthesis 13 p0071 A77-18898

Helio technique and development; Proceedings of the International Conference, Dhahran, Saudi Arabia, November 2-6, 1975. Volumes 1 & 2 13 p0072 A77-19043

Survey of quantitative data on the solar energy and its spectra distribution 13 p0072 A77-19044

Autonomous station for the acquisition and concentration of heliometric data 13 p0072 A77-19046

Development of a mobile solar testing and recording /STAR/ system --- trailer for domestic hot water system testing 13 p0072 A77-19047

Computation of solar radiation design curves 13 p0072 A77-19049

Waveguide high pass filter for thermal conversion of solar energy 13 p0073 A77-19054

Captation and concentration of solar energy 13 p0074 A77-19063

Performance of two fixed-mirror solar concentrators for process heat 13 p0074 A77-19065

Solar production of hydrogen as a means of storing solar energy 13 p0075 A77-19072

On the storage of solhydrogen 13 p0075 A77-19073

The theory of hydrogen production in a photoelectrochemical cell 13 p0075 A77-19075

Solar energy utilization - The photochemical approach 13 p0075 A77-19076

The photosynthetic production of hydrogen 13 p0075 A77-19077

Storage of solar energy in the form of potential hydraulic energy 13 p0075 A77-19078

Solar thermal power generation 13 p0077 A77-19095

Organic Rankine Cycle Engine development and solar energy utilization 13 p0077 A77-19096

Aerothermic power plant with artificial cyclone 13 p0077 A77-19098

Energy considerations in HHE power systems --- Heliohydroelectric and Helioelectrolytic systems 13 p0077 A77-19099

Survey of absorption refrigeration systems 13 p0078 A77-19105

Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106

Factors affecting the use of solar energy for cooling 13 p0078 A77-19108

The two enemies of industrial development of solar energy - Simplicity and economy 13 p0078 A77-19109

Solar-powered housing unit - Simulation of solar heating and cooling in Saudi Arabia 13 p0078 A77-19110

Combined solar and petroleum energy HVAC system for a commercial building in Dhahran --- Heating, Ventilating and Air Conditioning 13 p0078 A77-19111

Preliminary design data for a solar house in Riyadh, Saudi Arabia 13 p0078 A77-19112

Environmentally designed housing incorporating solar energy 13 p0079 A77-19115

Lumiducts for Ecopolis --- urban solar light collection and transmission system 13 p0079 A77-19116

Water pumping - A practical application of solar energy 13 p0079 A77-19117

New frontiers in solar and other energy options 13 p0079 A77-19118

Solar heating projects at the Institute for Environmental Research --- in Austria 13 p0079 A77-19119

Economic and social impact of solar powered transportation systems 13 p0079 A77-19120

Formulation of energy policies - The case of West Africa 13 p0080 A77-19124

The role of solar energy in developing nations - The perspectives in Mali 13 p0080 A77-19125

Solar energy in Switzerland 13 p0080 A77-19127

Demand electric rates - A new problem and challenge for solar heating 14 p0137 A77-20388

Regression study of solar radiation and electrical energy consumption 14 p0137 A77-20686

On the solar energy problem --- for heat and electric power production 14 p0138 A77-20742

An automatic solar disk tracking system for incident energy measurements 14 p0138 A77-20749

Response of a partially illuminated solar cell 14 p0139 A77-21025

Solar energy and electric utilities - Should they be interfaced 14 p0143 A77-21281

The quality category in solar engineering 14 p0143 A77-21310

Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312

Tower-type solar energy plant - Configuration and energy efficiency of concentrator 14 p0143 A77-21314

Conversion of solar energy by photosynthetic production of molecular hydrogen 14 p0143 A77-21316

International Conference on Solar Electricity, Toulouse, France, March 1-5, 1976, Reports 14 p0147 A77-21776

- Computational program for accurate predetermination of irradiance and illuminance in connection with solar energy utilization 14 p0147 A77-21777
- The economic collection and efficient utilization of solar energy 14 p0147 A77-21778
- Thermodynamic constraints, effective temperatures and solar cells 14 p0147 A77-21779
- Thermodynamic conversion systems as applied to solar energy 14 p0148 A77-21783
- Silicon solar cell development 14 p0148 A77-21784
- Antireflection cell structures - Coupling with a selective surface --- solar collector surface properties 14 p0148 A77-21790
- A geometrical spectral selective window --- for conversion of solar energy into heat 14 p0148 A77-21793
- Tradeoff between selectivity and concentration in the collection of solar energy 14 p0150 A77-21810
- Study of a heliostat system for a solar thermal converter with an energy of 10 MW 14 p0150 A77-21811
- Interaction between the solar mirror field and the thermodynamic system of a turning solar power plant 14 p0151 A77-21824
- Problems relating to heat storage --- at solar thermal power plant 14 p0152 A77-21826
- A study on solar tower power system 14 p0152 A77-21832
- 100 kilowatt-hours per day with RTC silicon solar cells 14 p0153 A77-21835
- Status report on the German experimental study for terrestrial solar electric generators 14 p0153 A77-21836
- Effect of components on converters --- solar cell array transistor and thyristor performance 14 p0153 A77-21841
- 10 MW solar thermal electric power plant design for solar day operation 14 p0153 A77-21842
- Thermoelectric conversion of solar energy by means of refractory B14Si compounds 14 p0154 A77-21848
- High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851
- Miniature applications for photovoltaic generators 14 p0155 A77-21853
- Does solar energy demand more land surface, and more materials or energy investment than nuclear energy or fossil fuels - A preliminary study 14 p0155 A77-21857
- Solar heating and cooling 14 p0156 A77-22025
- One MW/th/ bench model cavity receiver steam generator --- solar energy conversion system component 14 p0158 A77-22642
- Four different views of the heliostat flux density integral 14 p0158 A77-22645
- Operational chemical storage cycles for utilization of solar energy to produce heat or electric power 14 p0158 A77-22646
- Solar energy conversion - Work experience of a team applying methods and techniques of physics research to this sector 14 p0164 A77-23296
- Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297
- Design and testing of planar solar collectors 14 p0164 A77-23298
- Some preliminary considerations on photovoltaic conversion of solar energy 14 p0164 A77-23299
- Geometric katoptrics - Applications to solar energy 14 p0166 A77-23383
- Solar absorption air-conditioning performance in central Ohio 14 p0168 A77-23443
- Relationship between heat source temperature, heat sink temperature and coefficient of performance for solar-powered absorption air conditioners 14 p0168 A77-23446
- Absorption cycles for air-cooled solar air conditioning 14 p0168 A77-23447
- Selecting refrigerant-absorbent fluid systems for solar energy utilization 14 p0168 A77-23448
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Seattle, Wash., June 27-July 1, 1976, Proceedings 14 p0170 A77-23651
- Method for estimating solar heating and cooling system performance 14 p0170 A77-23653
- Initial test results for a solar-cooled townhouse in the mid-Atlantic region 14 p0170 A77-23655
- Heat and mass transfer problems associated with alternative energy production 14 p0176 A77-24216
- Electricity from the thermal power of the sea 14 p0176 A77-24218
- Solar retrofit in a large institutional building - An economic analysis 14 p0176 A77-24500
- Performance analysis of a solar-electrical system with a load and storage batteries 14 p0177 A77-24570
- Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes 14 p0177 A77-24571
- National Solar Energy Convention, Jadavpur University, Calcutta, India, November 29-December 1, 1976, Proceedings 14 p0177 A77-24659
- Basis for developing a solar energy inventory 14 p0179 A77-25360
- Solar energy for the Australian food processing industry 14 p0181 A77-25900
- Continuous solar air conditioning with ammonia/water absorption cycle 14 p0182 A77-26057
- Solar thermal electric power systems - Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474
- Optical and thermal performance analysis of three line focus collectors [ASME PAPER 76-WA/HT-15] 14 p0186 A77-26475
- A pressurized liquid concept for solar-thermal energy storage for the 24-hour continuous operation of an energy conversion system [ASME PAPER 76-WA/HT-38] 14 p0187 A77-26484
- Description of thermal storage sub-system designs for ERDA's 10-MWe Solar Central Receiver Pilot Plant [ASME PAPER 76-WA/HT-68] 14 p0187 A77-26491
- Heat transfer considerations of a nonconvecting solar pond heat exchanger [ASME PAPER 76-WA/SOL-4] 14 p0188 A77-26509
- Solar heating in the United States [ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513
- Development of compound parabolic concentrators for solar thermal applications [ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516
- Design and simulation studies for the Shenandoah Community Center large-scale solar cooling demonstration [ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520
- Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps [ASME PAPER 76-WA/SOL-23] 14 p0190 A77-26528
- A preliminary assessment of solar energy technology [ASME PAPER 76-WA/TS-1] 14 p0190 A77-26531
- Photoelectrochemical energy conversion and storage - The polycrystalline CdSe cell with different storage modes 14 p0196 A77-28463

- Possibilities and economic limits concerning solar heating 14 p0197 A77-28679
- Solar generators - Utilization of solar energy for supply of electric power 14 p0197 A77-28681
- Servo positioning power tower collectors for solar heat conversion to electricity 14 p0198 A77-28811
- Evaluation of cadmium stannate films for solar heat collectors 14 p0198 A77-29021
- Experience in using bimodal distribution curves to evaluate the reliability of systems supplying energy from renewable sources --- solar and wind systems for radio relay links 14 p0201 A77-29535
- Meteorological data regarding the utilization of solar energy 14 p0202 A77-29563
- The consideration of climatic data in the prediction of solar-system performance --- for energy conversion 14 p0202 A77-29569
- Energy considerations related to the acquisition, supply, and utilization of solar energy 14 p0203 A77-29572
- Energy-direct-conversion in solar technology 14 p0203 A77-29574
- Optics in solar energy utilization II; Proceedings of the Seminar, San Diego, Calif., August 24, 25, 1976 14 p0203 A77-29576
- Photovoltaic energy conversion using concentrated sunlight 14 p0203 A77-29579
- Wavelength-selective surfaces for solar energy utilization 14 p0204 A77-29583
- An educated ray trace approach to solar tower optics 14 p0204 A77-29592
- Principles and systems for utilization of solar energy in heating and preparation of hot water 15 p0255 A77-30257
- Matching of solar cells and performance of a solar battery 15 p0256 A77-30316
- Performance data for a terrestrial solar photovoltaic/water electrolysis experiment 15 p0256 A77-30321
- Lighting with sunlight using sun tracking concentrators 15 p0260 A77-31245
- Solar energy can be self-supporting long-term energy storage 15 p0261 A77-31371
- Alternative energy sources --- Book 15 p0261 A77-31467
- Solar-thermal energy systems 15 p0262 A77-31472
- Solar-thermal power systems 15 p0262 A77-31474
- Regenerative energy sources --- energy conversion and utilization feasibility 15 p0263 A77-31577
- Assessment of satellite power stations [AIAA PAPER 77-552] 15 p0266 A77-32069
- Cooling with solar energy 15 p0268 A77-32401
- Novel development for economic solar-energy utilization 15 p0268 A77-32402
- A solar generator --- for cold-steam turbine operations 15 p0268 A77-32403
- Production of electricity through thermodynamic conversion of solar energy - 10 MWe project 15 p0270 A77-32591
- Solar technology: Solar energy in practical application /3rd revised and enlarged edition/ --- German book 15 p0271 A77-33113
- The impact of the new energy technologies 15 p0272 A77-33124
- Solar tower characteristics 15 p0274 A77-33333
- Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy 15 p0274 A77-33334
- Synthetic fuels from solid wastes and solar energy 15 p0275 A77-33336
- Bioconversion of solar energy in salt water photosynthetic hydrogen production systems 15 p0278 A77-33369
- A thermodynamic analysis of H<sub>2</sub>CO<sub>3</sub>, a hydrogen conversion and storage system 15 p0280 A77-33387
- Combination of focusing concentrators and focusing lenses 15 p0286 A77-33431
- Combined cycles in single circuit solar refrigerating systems 15 p0286 A77-33434
- Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions 15 p0286 A77-33435
- Applied solar energy: An introduction /2nd edition/ --- Book 15 p0286 A77-33445
- The chemical conversion of sunlight 15 p0287 A77-33598
- Sun power: An introduction to the applications of solar energy --- Book 15 p0288 A77-33967
- Solar electricity for military applications 15 p0289 A77-34113
- Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant --- utilizing Stirling engine 15 p0291 A77-34974
- Solar energy, its conversion and utilization 15 p0294 A77-35316
- Utilizing alternative energy sources in France 15 p0296 A77-35923
- Solar energy prospects grow for US southwest 15 p0297 A77-36049
- Solar energy and energy storage --- French book 15 p0297 A77-36104
- A simple model for solar energy economics in the U.K 15 p0298 A77-36245
- The economics of industrial process heat from solar energy 15 p0302 A77-36345
- Solar energy in the building --- French book 15 p0303 A77-36411
- 100 MWe solar power plant design configuration and performance [AAS 75-288] 15 p0305 A77-36556
- Cool it, sun --- space heating and cooling 15 p0305 A77-36627
- Solar shade control - New law for a new technology 15 p0306 A77-36764
- Solar energy - Where are the opportunities --- climate control equipment manufacture 15 p0307 A77-36799
- Solar energy depot --- using liquid hydrogen as fuel and oxygen as oxidizer [AIAA PAPER 77-726] 15 p0311 A77-37251
- Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765
- Analysis of a faceted concentration system 15 p0316 A77-37769
- Solar energy systems of the tower type - Arrangement and heat-stability of the receivers and steam generators 15 p0316 A77-37770
- Study of the characteristics of convective heat transfer in cylindrical solar energy receivers by solving the conjugate problem of heat exchange 15 p0316 A77-37771
- Study of an absorption solar refrigeration unit functioning on a round-the-clock basis 15 p0316 A77-37772
- Solar heating in residential houses in Uzbekistan 15 p0316 A77-37774
- Modeling algorithms and their implementation on a digital computer for calculating the capacity of storage cells at wind-power and solar energy installations 15 p0316 A77-37775

- Sandia studies for ERDA central receiver thermal electric power project --- Solar generating system 15 p0318 A77-38208
- Conceptual heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility at Sandia, Albuquerque 15 p0318 A77-38209
- Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters 15 p0320 A77-38330
- Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells 15 p0320 A77-38367
- Theoretical treatment of the photoelectrochemical production of hydrogen --- semiconductor electrode for solar applications 15 p0321 A77-38530
- A small but important contribution to the German-American solar research programme 'Helios' 15 p0323 A77-39125
- Application of heat pipes to ground storage of solar energy [AIAA PAPER 77-729] 15 p0324 A77-39507
- Photoelectrolysis with YFeO<sub>3</sub> electrodes --- water splitting using solar energy 16 p0399 A77-40553
- Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters 16 p0402 A77-41360
- Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563
- Use of adsorbent beds for energy storage in drying of heating systems 16 p0405 A77-41577
- Cost studies on terrestrial photovoltaic power systems with sunlight concentration 16 p0405 A77-41579
- The effect of design and operating parameters on the performance of flat plate solar collectors - Calculation method and detailed appraisal 16 p0406 A77-41580
- Fundamentals of solar-energy survey development 16 p0409 A77-41910
- Solar power systems 16 p0416 A77-42895
- Economic analysis of solar total energy systems 16 p0416 A77-42896
- Optimum design of a single slope solar still in Riyadh, Saudi Arabia 16 p0417 A77-42956
- Energy supply of the Federal Republic of Germany 16 p0419 A77-43566
- Solar energy in tropical and subtropical countries 16 p0421 A77-44449
- A terrestrial solar thermal electric power system - Development of basic model system 16 p0422 A77-44478
- Energy corradation using the reversible ammonia reaction --- for solar power generation 16 p0422 A77-44483
- Fundamental studies on heat storage of solar energy 16 p0423 A77-44490
- The utilization of solar energy in Central Europe 16 p0426 A77-45461
- Solar energy in Australia 16 p0426 A77-45499
- Combination of foccns and foclines with radiation receivers 16 p0427 A77-45544
- Conjugate cycles of single-loop solar power and refrigeration plants 16 p0427 A77-45547
- Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia 16 p0427 A77-45548
- Morphological analysis as a design aid: An application to solar energy conversion processes --- French book 16 p0429 A77-46467
- Earth, an open system - The use of solar energy 16 p0432 A77-46788
- Power with heliostats 16 p0433 A77-47174
- Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421
- Analyzing multifacet concentrating systems --- solar energy application 16 p0437 A77-47425
- A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators 16 p0437 A77-47426
- Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem 16 p0437 A77-47427
- Investigation of solar absorption cooler for round-the-clock operation 16 p0437 A77-47428
- Residential solar heating in Uzbekistan 16 p0437 A77-47430
- Simulation algorithms and their realization by digital computer for calculation of wind- and solar-plant storage-service capacity 16 p0437 A77-47431
- Solar energy - The good features of amorphous silicon 16 p0438 A77-47850
- Energy output and service life characteristics of high-voltage low-temperature thermopiles 16 p0442 A77-48517
- Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions 16 p0442 A77-48518
- Procedure for calculating thermocompressor thermodynamical parameters --- for solar energy conversion 16 p0442 A77-48519
- Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant 16 p0445 A77-48717
- The design of a sodium sulfate decahydrate heat exchanger for coolness storage --- in solar-powered air conditioning system 16 p0450 A77-48760
- Photovoltaic applications for the National Park Service 16 p0460 A77-48837
- An assessment of mechanical energy storage for solar systems 16 p0460 A77-48839
- Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- Thermal energy storage 16 p0461 A77-48841
- Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant 16 p0461 A77-48842
- Design of sodium-cooled, central receiver solar power plant 16 p0461 A77-48843
- Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design 16 p0461 A77-48844
- Dynamic modeling and sensitivity analysis of solar thermal energy conversion systems 16 p0461 A77-48845
- 1 MWth solar cavity steam generator solar test program 16 p0461 A77-48846
- Miniature solar-electric power system 16 p0462 A77-48848
- Stimulation of the solar industry by way of the Federal Buildings Program 16 p0462 A77-48850
- Present state and perspective of solar energy applications in Mexico 16 p0469 A77-48911
- ERDA Solar Thermal Energy Program for industrial process heat 16 p0470 A77-48922
- Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923
- The climatology of available solar energy for Canada 16 p0471 A77-48924
- Insolation data for solar energy conversion derived from satellite measurements of earth radiance 16 p0471 A77-48930

- Experimental and theoretical studies on solar energy for energy conversion 16 p0471 A77-48932
- Climatological constraints on the development of solar energy in Canada 16 p0480 A77-49005
- Solar energy for process heat 16 p0481 A77-49020
- A solar/Stirling total energy system 16 p0481 A77-49021
- Smith multimodule solar-electric plant 16 p0482 A77-49023
- Study of a solar assisted diffusion separation process for isotopic mixtures 16 p0483 A77-49030
- Solar thermal electric power systems - Comparison of line focus collectors 16 p0483 A77-49032
- Turntable solar arrays 16 p0483 A77-49033
- Technical feasibility of a modular dish solar electric system 16 p0483 A77-49034
- Central receiver solar thermal power 16 p0484 A77-49037
- High-temperature energy storage in native rocks 16 p0492 A77-49104
- Thermal energy storage using large hollow steel ingots 16 p0492 A77-49106
- An assessment of hydrogen as a means to store solar energy 16 p0492 A77-49107
- Storage of solar energy by inorganic oxide/hydroxides 16 p0492 A77-49109
- Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- Payback of solar systems --- cost effectiveness evaluation by dynamic economical model 16 p0493 A77-49115
- Solar system market capture in the climato-economic regions of the United States 16 p0493 A77-49116
- Incentives and barriers to the development of solar energy 16 p0494 A77-49119
- Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- Daedalphobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada 16 p0494 A77-49121
- Economic study of solar total energy 16 p0494 A77-49124
- Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126
- Technical and socio-economic aspects of solar energy and rural development in developing countries 16 p0494 A77-49128
- Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131
- Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132
- The updated homesteader 16 p0495 A77-49136
- Perceptual assessment of a new energy concept 16 p0496 A77-49138
- Rural energy centre for Africa using solar, wind and biogas energies 16 p0496 A77-49139
- Georgia Tech 400 KWth solar thermal test facility 16 p0498 A77-49158
- Solar energy conversion with fluorescent collectors 16 p0499 A77-49166
- On power-generating thermojunctions with radial flow of current --- for solar energy conversion 16 p0500 A77-50202
- Hydrogen quantum yields in the 360 nm photolysis of  $\text{Eu}^{2+}$  solutions and their relationship to photochemical fuel formation 16 p0501 A77-50203
- On the study of applications of solar thermal energy for mobile homes 16 p0501 A77-50204
- Hydrogen production from water utilizing solar heat at high temperatures 16 p0501 A77-50205
- The use of functionalized polymers as photosensitizers in an energy storage reaction 16 p0501 A77-50208
- A design procedure for solar air heating systems 16 p0501 A77-50209
- Solar energy and the residence - Some systems aspects 16 p0502 A77-50213
- The dependence of current output of the Ti-Tl  $\text{SnO}_2/\text{Pt}$  iron-thionine photogalvanic cell on photostationary state composition --- Totally Illuminated, Thin Layer 16 p0502 A77-50220
- Studies of technological processes by solar energy under cosmic simulated conditions [IAF PAPER 77-54] 16 p0506 A77-51411
- A new cycle for optimum energy storage in interplanetary missions [IAF PAPER 77-141] 16 p0507 A77-51444
- Critical materials problems in energy production --- Book 16 p0509 A77-51627
- LSSA (Low-cost Silicon Solar Array) project [NASA-CR-149091] 13 p0086 N77-10637
- Photochemical conversion of solar energy [PB-255703/1] 13 p0090 N77-10685
- Analysis of state solar energy options [PB-254730/5] 13 p0091 N77-10688
- National program for solar heating and cooling (residential and commercial applications) [ERDA-23A] 13 p0098 N77-11540
- Applied research on II-VI compound [PB-254637/2] 13 p0098 N77-11547
- Semiconductor-electrolyte photovoltaic energy converter [PB-252837/0] 13 p0099 N77-11548
- Status of silicon solar cell technology [NASA-TN-X-73531] 13 p0106 N77-12519
- The feasibility of solar energy usage on Red River Army Depot [AD-A025119] 13 p0108 N77-12535
- Symposium on the Fundamental Optical Properties of Solids Relevant to Solar Energy Conversion [PB-256615/6] 13 p0108 N77-12538
- Development of 20 percent efficient solar cell [PB-255903/7] 13 p0108 N77-12548
- Definition study for photovoltaic residential prototype system [NASA-CR-135056] 13 p0113 N77-13533
- Status of the ERDA/NASA photovoltaic tests and applications project [NASA-TN-X-73567] 13 p0114 N77-14537
- LLL-Sohio solar process heat project. Report no. 3: LLL solar energy group [UCID-16630-3] 13 p0123 N77-14604
- The optical properties of chromium oxide films and the high temperature stabilization of silver films for photothermal solar energy conversion 13 p0128 N77-15484
- Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis of orbital systems [NASA-CR-150147] 13 p0129 N77-15495
- Space-based solar power conversion and delivery systems study. Volume 3: Economic analysis of space-based solar power systems [NASA-CR-150148] 13 p0129 N77-15496
- The design of a solar energy collection system to augment heating and cooling for a commercial office building [NASA-TN-X-72753] 14 p0207 N77-16446
- Optimization of absorption air-conditioning for solar energy applications [NASA-CR-150176] 14 p0210 N77-17560
- Improved backwall cell [NASA-CASE-LEW-12236-1] 14 p0211 N77-17565
- Economic study of solar total energy [SAND-76-5291] 14 p0216 N77-18574
- Investigation of low cost solar cells based on  $\text{Cu}_2\text{O}$  [PB-258583/4] 14 p0217 N77-18582
- Investigation of low cost solar cells based on  $\text{Cu}_2\text{O}$  [PB-258746/7] 14 p0217 N77-18583

## SUBJECT INDEX

## SOLAR ENERGY CONVERSION CONTD

- Solar assisted heat pump demonstration project,  
phase 1  
[PB-259289/7] 14 p0217 N77-18589
- Navy applications for terrestrial photovoltaic  
solar power  
[AD-A030529] 14 p0218 N77-18590
- Computer modeling of a regenerative solar-assisted  
Rankine power cycle  
14 p0218 N77-19112
- Precision insolation measurement under field  
conditions  
14 p0219 N77-19113
- Coefficient of performance for solar-powered space  
cooling systems  
[CONF-760618-1] 14 p0220 N77-19585
- InterTechnology Corporation proposed systems level  
plan for solar heating and cooling, commercial  
buildings. Volume 1: National solar  
demonstration program  
[COO-2688-76-6-VOL-1] 14 p0224 N77-19632
- InterTechnology Corporation proposed systems level  
plan for solar heating and cooling, commercial  
buildings. Volume 2: National solar  
demonstration program  
[COO-2688-76-6-VOL-2] 14 p0224 N77-19633
- InterTechnology Corporation proposed systems level  
plan for solar heating and cooling, commercial  
buildings. Volume 3: National solar  
demonstration program  
[COO-2688-76-6-VOL-3] 14 p0224 N77-19634
- Photovoltaic energy conversion using concentrated  
sunlight  
[SAND-76-5759] 14 p0225 N77-19647
- Description of the solar energy R and D programs  
in many nations  
[SAN/1122-76/1] 14 p0225 N77-19648
- Central receiver solar thermal power system.  
Collector subsystem research experiments  
[SAN/1111-76/2] 14 p0225 N77-19649
- Preliminary report on simulation of a heliostat  
field  
[ERDA-TR-158] 14 p0226 N77-19782
- Study of the application of solar chemical  
dehumidification system to wind tunnel  
facilities of NASA Lewis Research Center at  
Cleveland, Ohio  
[NASA-CR-149886] 14 p0227 N77-20116
- An economic and performance design study of solar  
preheaters for domestic hot water heaters in  
North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- Application of chemical dehumidification system to  
a roof fan house at Michoud Assembly Facility at  
New Orleans, Louisiana  
[NASA-CR-149888] 14 p0228 N77-20560
- Summary report of technical discussion, NASA-ERDA  
solar energy proposal  
14 p0229 N77-20562
- Analysis of GaAs and Si solar energy hybrid systems  
[NASA-CR-2800] 14 p0229 N77-20564
- Solar energy, DFVLR activities  
[ERDA-TR-143] 14 p0230 N77-20575
- Proceedings of an EPRI Workshop on Technologies  
for Conservation and Efficient Use of Electric  
Energy. Volume 1: Overview  
[PB-261469/1] 14 p0230 N77-20577
- Design and modeling of solar sea power plants by  
geometric programming  
[COO-2895-T1] 14 p0231 N77-20585
- Technology evaluation report, commercial buildings  
[COO-2683-76-1] 14 p0232 N77-20603
- Solar energy subsystems employing isothermal heat  
sink materials  
[PB-258738/4] 14 p0233 N77-20616
- Evaluation of the solar heating system in the Lof  
residence, Denver, Colorado  
[PB-258845/7] 14 p0233 N77-20617
- The evaluation of surface geometry modification to  
improve the directional selectivity of solar  
energy collectors  
[PB-258848/1] 14 p0233 N77-20618
- Bioconversion of solar energy in salt water:  
Photosynthetic hydrogen production systems  
14 p0239 N77-21603
- Optimization studies of solar absorption air  
conditioning systems  
[NSP/RANN/SE/GI-39117/PR-76/2] 14 p0250 N77-21690
- Rankine cycle energy conversion system design  
considerations for low and intermediate  
temperature sensible heat sources  
[SAND-76-0363] 14 p0251 N77-21699
- Photovoltaic II-VI compound heterojunctions for  
solar energy conversion  
[PB-259195/6] 14 p0251 N77-21702
- Proceedings of First Semiannual EPRI Solar Program  
Review Meeting and Workshop. Volume 1: Solar  
heating and cooling of buildings  
[PB-260594/7] 14 p0252 N77-21721
- Development of the solar power central receiver  
concept  
[SAND-76-8677] 15 p0344 N77-22624
- Biological solar energy conversion: Approaches to  
overcome yield, stability and product limitations  
[PB-261910/4] 15 p0350 N77-22688
- A federal procurement plan to accelerate use of  
solar energy  
[PB-263369/1] 15 p0356 N77-23618
- Solar breeder: Energy payback time for silicon  
photovoltaic systems  
[NASA-CR-153060] 15 p0362 N77-24581
- Critical areas: Satellite power systems concepts  
[NASA-TM-X-74694] 15 p0362 N77-24585
- An economic analysis of solar water and space  
heating  
[DSE/2322-1] 15 p0363 N77-24588
- Progress report on the performance of three  
Australian solar hot water systems  
[SES-8] 15 p0364 N77-24604
- United States special format report: Performance  
of the Sohio Solar Water Heating System using  
large area plastic collectors (Grants, New Mexico)  
[SAN/1038-76/1] 15 p0365 N77-24606
- Determining the technical and economic feasibility  
of utilizing solar energy for heating buildings  
in Canada  
[NP-21308] 15 p0365 N77-24611
- Photochemical conversion of solar energy  
[PB-262450/0] 15 p0366 N77-24628
- Proceedings of the Solar Industrial Process Heat  
Workshop  
[CONF-760655] 15 p0373 N77-25643
- Predicting the performance of solar energy systems  
[AD-A035608] 15 p0373 N77-25660
- Solar heating and cooling technical data and  
systems analysis  
[NASA-CR-150305] 15 p0378 N77-26611
- New energy conservation ideas for existing and new  
buildings  
[CONF-750942-2] 15 p0382 N77-26660
- OTEC annual report to the Division of Solar Energy  
for FY-1976 and the transition quarter  
[BNWL-2154] 15 p0382 N77-26665
- Theoretical analysis of the EWEC report  
[NASA-CR-152542] 15 p0390 N77-27493
- Review of solar cooling  
[CONF-760842-9] 15 p0393 N77-27535
- Santa Clara, California, community center,  
commercial solar demonstration legal  
alternatives, implications, and financing of  
solar heating and cooling by a municipal  
corporation  
[SAN/1083-76/1] 15 p0394 N77-27549
- Hydrocarbon fuels from solar energy via the alga  
Botryococcus brauni  
[ABL/HECH-ENG-148] 16 p0513 N77-28576
- Options for demonstrating the use of solar energy  
in California buildings  
[NASA-CR-154103] 16 p0513 N77-28582
- Design procedure for solar air heating systems  
[CONF-760842-14] 16 p0514 N77-28589
- Cooling subsystem design in CUS solar house 3  
[COO-2858-1] 16 p0514 N77-28592
- National program plan for research and development  
in solar heating and cooling  
[ERDA-76-144] 16 p0514 N77-28597
- Electric utility solar energy activities, 1976  
survey  
[EPRI-ER-321-SR] 16 p0515 N77-28598
- Exploration of molecular sieve zeolites for the  
cooling of building with solar energy  
[PB-266055/3] 16 p0517 N77-28620
- Solar radiation atmospheric transmission research,  
phase 1  
[PB-266010/8] 16 p0518 N77-28689

- Impact of alternative energy forms on public utilities 16 p0525 N77-30275
- Recent developments in photovoltaic energy by ERDA/NASA-LeRC 16 p0526 N77-30277
- Sensitivity of solar cell performance to atmospheric variables. 1: Single cell 16 p0527 N77-30534
- Horizontally mounted solar collector [NASA-CASE-MPS-23349-1] 16 p0529 N77-30613
- Photon energy storage in organic materials: The case of linked anthracenes [AD-A039702] 16 p0535 N77-31615
- Solar Collection Module Test Facility, instrumentation fluid loop number one [SAND-76-0425] 16 p0535 N77-31619
- Survey of the applications of solar thermal energy systems to industrial process heat. Volume 3: Solar thermal energy systems analysis and preliminary assessment of related nontechnical issues [TID-27348-VOL-3] 16 p0537 N77-31638
- Survey of the applications of solar thermal energy systems to industrial process heat. Volume 2: Industrial process heat survey [TID-27348-VOL-2] 16 p0537 N77-31639
- Summary report: An exploratory study of cost targets for solar electric power plants [ORNL-TM-5787] 16 p0538 N77-31654
- Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems [PB-267832/4] 16 p0539 N77-31663
- NASA authorization, 1978, volume 1, part 3 [GPO-92-294] 16 p0542 N77-32032
- Evaluation of the CdS/CdTe heterojunction solar cell 16 p0545 N77-32584
- Further development of the compressed-film floating-deck solar water heater [PB-268514/7] 16 p0547 N77-32603
- Silicon Schottky photovoltaic diodes for solar energy conversion [PB-268457/9] 16 p0547 N77-32604
- Solar power satellite. Concept evaluation. Activities report. Volume 2: Detailed report [NASA-TM-74942] 16 p0552 N77-33600
- Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems [PB-267832/4] 16 p0554 N77-33618
- Design guidelines for energy conserving systems [PB-268989/1] 16 p0559 N77-33670
- SOLAR FLUX**
- Calorimetry of large solar concentrators 13 p0038 A77-12814
- Methods for estimating total flux in the direct solar beam at any time 16 p0471 A77-48934
- Characteristics of the concentrated solar flux produced by the FNSC prototype --- Fixed Mirror Solar Concentrator 16 p0474 A77-48953
- Use of radiation reflected from earth to increase the power of solar panels 15 p0363 N77-24586
- SOLAR FLUX DENSITY**
- Survey of quantitative data on the solar energy and its spectra distribution 13 p0072 A77-19044
- Procedure for characterizing flat plate solar collectors 13 p0073 A77-19056
- Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312
- High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851
- High-sensitivity detection procedures and devices for angular variations - Application to automatic control of a solar furnace heliostat 14 p0166 A77-23386
- An educated ray trace approach to solar tower optics 14 p0204 A77-29592
- Solar flux density distributions on central tower receivers 15 p0256 A77-30318
- A solar flux density calculation for a solar tower concentrator using a two-dimensional Hermite function expansion 16 p0405 A77-41578
- Solar flux density distributions on central tower receivers 16 p0484 A77-49038
- SOLAR FURNACES**
- Design and fabrication of solar concentrators 13 p0074 A77-19062
- High-sensitivity detection procedures and devices for angular variations - Application to automatic control of a solar furnace heliostat 14 p0166 A77-23386
- The French CNRS 1000 kW solar furnace - Description, performance characteristics, present utilization, and perspectives 15 p0262 A77-31473
- 1-MW solar boiler tested 15 p0303 A77-36349
- Energy conditions of welding with solar radiation 16 p0421 A77-44274
- 1 MWth solar cavity steam generator solar test program 16 p0461 A77-48846
- Application of chemical engineering to large scale solar energy 16 p0491 A77-49098
- Georgia Tech high temperature solar test facility 16 p0500 A77-49745
- Studies of technological processes by solar energy under cosmic simulated conditions [IAF PAPER 77-54] 16 p0506 A77-51411
- The structure of building specifications [PB-257581/9] 13 p0132 N77-15524
- SOLAR GENERATORS**
- Design principles for solar and wind power installations 13 p0015 A77-11922
- Optimization criteria for solar and wind power systems 13 p0015 A77-11923
- Some features of the operation of a solar installation acting as a low-temperature source of heat for a heat pump 13 p0015 A77-11924
- Coming - Solar power plants 13 p0016 A77-12125
- Thermal energy storage for solar power plants 13 p0027 A77-12731
- Thermal energy storage considerations for solar-thermal power generation 13 p0027 A77-12732
- Solar thermal electric power plants - Their performance characteristics and total social costs 13 p0037 A77-12804
- Economic optimization of the energy transport component of a large distributed solar power plant 13 p0037 A77-12807
- Collector field optimization for a solar thermal electric power plant 13 p0038 A77-12811
- Problems of energy storage in solar power stations 13 p0063 A77-17555
- Economic effectiveness of solar electric power stations 13 p0063 A77-17556
- The application of aerospace technology to solar thermal electric power generation [AIAA PAPER 77-294] 13 p0065 A77-18226
- Linear model of a dissipative PWM shunt regulator --- Pulse Width Modulation 13 p0080 A77-19172
- The economic collection and efficient utilization of solar energy 14 p0147 A77-21778
- Thermodynamic conversion systems as applied to solar energy 14 p0148 A77-21783
- Evaluation of CdS photovoltaic cells in the framework of the development of solar electric power plants 14 p0149 A77-21796
- Utilization of solar radiation in large solar power plants with hydraulic storage 14 p0152 A77-21827
- Turbines and turbogenerators for solar power plants with thermodynamic cycles 14 p0152 A77-21828



## SUBJECT INDEX

## SOLAR GENERATORS CONTD

- The thermodynamic cycle of the OHEESOL engine --- solar Rankine piston engine 14 p0152 A77-21829
- Thermal optimization of steam generating systems for tower type solar steam power plants - Tasks and methods 14 p0152 A77-21830
- The solar tower as a source of thermal electric energy 14 p0152 A77-21831
- Performance rating of photovoltaic solar generators for terrestrial applications 14 p0153 A77-21837
- A power plant of the Aerosolec type 14 p0153 A77-21839
- Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia 14 p0153 A77-21840
- Development of a 10 kWe solar thermal power station 14 p0154 A77-21844
- Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost 14 p0154 A77-21845
- Potentialities of electric energy production by means of thermoelectric generators 14 p0154 A77-21847
- Miniature applications for photovoltaic generators 14 p0155 A77-21853
- Some applications of photovoltaic solar energy 14 p0155 A77-21855
- Does solar energy demand more land surface, and more materials or energy investment than nuclear energy or fossil fuels - A preliminary study 14 p0155 A77-21857
- Effect of the characteristics of electrical supply networks on the design of solar power plants 14 p0155 A77-21858
- Principal stages in the development of thermoelectric power in the USSR 14 p0156 A77-22123
- One MW/th/ bench model cavity receiver steam generator --- solar energy conversion system component 14 p0158 A77-22642
- A rationale for large space-based solar power systems [AIAA PAPER 77-510] 14 p0173 A77-23926
- A solar power system with gallium arsenide solar cells [AIAA PAPER 77-519] 14 p0174 A77-23932
- Solar generators - Utilization of solar energy for supply of electric power 14 p0197 A77-28681
- Survey of selective absorber coatings for solar energy technology 14 p0199 A77-29067
- Composition method for constructing guaranteed-output curves of solar- and wind-power plants utilized jointly 14 p0201 A77-29534
- Development of solar tower program in the United States 14 p0204 A77-29591
- Solar-heated-air receivers --- of solar/gas turbine electrical generation plant design 15 p0255 A77-30312
- Use of solar generators in Africa for broadcasting equipment 15 p0256 A77-30320
- Energy investment in nuclear and solar power plants 15 p0257 A77-30599
- Space solar power - The transportation challenge --- for Space Shuttle [AIAA PAPER 77-529] 15 p0266 A77-32054
- A solar generator --- for cold-steam turbine operations 15 p0268 A77-32403
- Solar electric power generating stations in space - XXI century energy or a utopia 15 p0269 A77-32470
- Solar energy, its conversion and utilization 15 p0294 A77-35316
- Tests of a combined wind and solar power plant under natural conditions 15 p0294 A77-35415
- 1-MW solar boiler tested 15 p0303 A77-36349
- Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765
- Sandia studies for ERDA central receiver thermal electric power project --- Solar generating system 15 p0318 A77-38208
- Modeling aspects of a gas turbine solar-electric power system 15 p0318 A77-38210
- The rate of mass transfer in a solar regenerator 15 p0323 A77-39109
- Solar generators - Utilization of solar energy for power-supply applications 15 p0336 A77-39980
- The future of solar-thermal small-scale power stations 15 p0336 A77-39981
- Solar thermal electricity - Power tower dominates research 16 p0400 A77-40647
- Optimum concentration ratio for a solar central-receiver electric power plant 16 p0409 A77-41865
- Solar electricity - The hybrid system approach 16 p0413 A77-42556
- Low-profile heliostat design for solar central receiver systems 16 p0422 A77-44480
- Energy corradation using the reversible ammonia reaction --- for solar power generation 16 p0422 A77-44483
- Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421
- Comparative assessment of orbital and terrestrial central power plants 16 p0465 A77-48878
- Solar thermionic power systems for terrestrial applications 16 p0466 A77-48893
- Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures --- compatible with flat-plate solar collectors 16 p0475 A77-48962
- Conceptual design of an open cycle gas turbine solar central receiver system 16 p0481 A77-49022
- A central receiver solar system applicable to central power stations 16 p0483 A77-49036
- Collector field design for a central receiver solar thermal power plant 16 p0484 A77-49039
- Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility 16 p0484 A77-49040
- Assessment of the socio-economic and environmental aspects of the central receiver power plants 16 p0494 A77-49122
- Georgia Tech 400 KWth solar thermal test facility 16 p0498 A77-49158
- Solar power arrays for the concentration of energy [COO-2699-2] 13 p0087 A77-10651
- Costs of alternative sources of electricity [PB-255765/0] 13 p0107 A77-12528
- Solar cell array design handbook, volume 1 [NASA-CR-149364] 13 p0118 A77-14193
- Solar cell array design handbook, volume 2 [NASA-CR-149365] 13 p0118 A77-14194
- LLI-Sohio solar process heat project. Report no. 3: LLI solar energy group 13 p0123 A77-14604
- Industrial process heat from shallow solar ponds [UCRL-77801] 13 p0124 A77-14611
- Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis of orbital systems [NASA-CR-150147] 13 p0129 A77-15495
- Space-based solar power conversion and delivery systems study. Volume 3: Economic analysis of space-based solar power systems [NASA-CR-150148] 13 p0129 A77-15496
- Space-based power conversion and power relay systems: Preliminary analysis of alternate systems [NASA-CR-150171] 14 p0207 A77-16447

- Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program [PB-257770/8] 14 p0208 N77-16452
- Penetration analysis and margin requirements associated with large-scale utilization of solar power plants [PB-257546/2] 14 p0208 N77-16459
- Computer modeling of a regenerative solar-assisted Rankine power cycle 14 p0218 N77-19112
- Solar power satellite: Analysis of alternatives for transporting material to geosynchronous orbit [NASA-TM-X-74680] 14 p0235 N77-21136
- Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 2: Solar electric power [PB-260565/4] 14 p0252 N77-21722
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-152688] 15 p0343 N77-22612
- WATSUN: A solar heating simulation and economic evaluation program [NP-21307] 15 p0364 N77-24603
- Assembly and testing of a 1.8 by 3.7 meter Fresnel lens solar concentrator [NASA-CR-150300] 15 p0378 N77-26610
- Central receiver solar thermal power system, phase 1 [SAN/1110-76/1] 15 p0394 N77-27550
- Recommendations for the performance rating of flat plate terrestrial photovoltaic solar panels 16 p0527 N77-30539
- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 N77-31207
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-155042] 16 p0546 N77-32594
- SOLAR HEATING**
- Solar energy --- conversion technology assessment 13 p0006 A77-11037
- Plastics for solar-energy collectors. I - General aspects, hot-water collectors, design variants 13 p0009 A77-11267
- Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub> 13 p0013 A77-11568
- The solar water heater industry in South Florida - History and projections 13 p0018 A77-12403
- A cylindrical blackbody solar energy receiver 13 p0018 A77-12404
- Grain drying in stationary bins with solar heated air 13 p0019 A77-12411
- A forced circulation system for solar water heating 13 p0019 A77-12413
- Thermal energy storage considerations for solar-thermal power generation 13 p0027 A77-12732
- Space heating systems new and conventional in the Northwest with emphasis on alternate energy adaptations 13 p0028 A77-12736
- HYCSOS - A solar heating, cooling and energy conversion system based on metal hydrides 13 p0029 A77-12740
- A unique Rankine-cycle heat pump system 13 p0036 A77-12799
- Solar-powered Rankine-cycle heat pump system 13 p0036 A77-12800
- Performance and cost analysis of photovoltaic power systems for on-site residential applications 13 p0038 A77-12816
- An integrated photovoltaic/thermal High Intensity Solar Energy System /HISES/ concept for residential applications 13 p0039 A77-12818
- Long term performance prediction of residential solar energy heating systems 13 p0039 A77-12822
- Atlanta /Towns/ solar experiment - The lessons we learned 13 p0047 A77-13503
- The Shenandoah Community Center - A total solar design concept 13 p0047 A77-13506
- Practical aspects of solar heating - A review of materials use in solar heating applications 13 p0049 A77-13743
- Calculation of the radiation entering a 'hot box' type solar set-up 13 p0051 A77-14581
- Thermal energy storage for heating and air conditioning 13 p0057 A77-16206
- A central solar energy utilization system 13 p0057 A77-16210
- Homeowner's guide to solar heating and cooling --- Book 13 p0062 A77-17525
- Contribution of the heat carried by solar radiation to the thermal balance of a room during the cold season and its effect on domestic fuel consumption 13 p0063 A77-17558
- Development of a mobile solar testing and recording /STAR/ system --- trailer for domestic hot water system testing 13 p0072 A77-19047
- Solar water heater using hardened black polythene pipe absorbers 13 p0073 A77-19060
- Thermo-chemical production of hydrogen 13 p0075 A77-19074
- Selection of optimal pan color for solar water heater 13 p0078 A77-19104
- The two enemies of industrial development of solar energy - Simplicity and economy 13 p0078 A77-19109
- Heating a building by means of solar and electrical energy 13 p0078 A77-19113
- Application of solar heat to buildings in Austria 13 p0079 A77-19114
- Solar heating projects at the Institute for Environmental Research --- in Austria 13 p0079 A77-19119
- Annular-flow solar heater collector tubes [AIAA PAPER 77-190] 14 p0135 A77-19886
- Demand electric rates - A new problem and challenge for solar heating 14 p0137 A77-20388
- Equations for cold production of an absorption refrigerating solar unit 14 p0137 A77-20397
- On the solar energy problem --- for heat and electric power production 14 p0138 A77-20742
- A geometrical spectral selective window --- for conversion of solar energy into heat 14 p0148 A77-21793
- Tradeoff between selectivity and concentration in the collection of solar energy 14 p0150 A77-21810
- Use of solar water-heating installations in the combined cycle of a thermal electric power plant 14 p0152 A77-21825
- Utilization of solar radiation in large solar power plants with hydraulic storage 14 p0152 A77-21827
- A modular fixed-mirror Brayton-cycle solar power system 14 p0154 A77-21846
- Solar heating and cooling 14 p0156 A77-22025
- Solar space heating and cooling with Bi-heat source heat pump and hot water supply system 14 p0158 A77-22643
- Preliminary performance of CSU Solar House I heating and cooling system 14 p0158 A77-22644
- The University of Pennsylvania Solar Heating/Cooling System Program 14 p0167 A77-23439
- Design application using solar energy to control the environment in a major office building 14 p0168 A77-23442
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Seattle, Wash., June 27-July 1, 1976, Proceedings 14 p0170 A77-23651
- Method for estimating solar heating and cooling system performance 14 p0170 A77-23653

- A progress report on the national program for solar heating and cooling 14 p0170 A77-23656
- Solar retrofit in a large institutional building - An economic analysis 14 p0176 A77-24500
- Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes 14 p0177 A77-24571
- Simulation and cost optimization of solar heating of buildings in adverse solar regions 14 p0180 A77-25897
- Storage tanks - A numerical experiment --- for solar heating 14 p0180 A77-25898
- Operational modes of solar heating and cooling systems 14 p0180 A77-25899
- Determination of average ground reflectivity for solar collectors 14 p0181 A77-25903
- Double-exposure collectors with mirrors for solar-heating systems [ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476
- Performance of flat-plate collectors with planar reflectors [ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478
- Design and costs of high temperature thermal storage devices using salts or alloys [ASME PAPER 76-WA/HT-34] 14 p0187 A77-26481
- Solar heating thermal storage feasibility [ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483
- A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM --- Phase Change Material [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- Description of thermal storage sub-system designs for ERDA's 10-MWe Solar Central Receiver Pilot Plant [ASME PAPER 76-WA/HT-68] 14 p0187 A77-26491
- The proper use of thermal storages for a solar assisted heat pump heating system [ASME PAPER 76-WA/HT-76] 14 p0187 A77-26492
- Solar heating in the United States [ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513
- The New Mexico Department of Agriculture solar heated and cooled building [ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515
- Development of compound parabolic concentrators for solar thermal applications [ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516
- An experimental and analytical investigation of a solar water heater [ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- The HBB solar houses - Design, operation, and experience 14 p0197 A77-28678
- Possibilities and economic limits concerning solar heating 14 p0197 A77-28679
- Physical, chemical, and technological principles of latent heat storage 14 p0203 A77-29571
- Energy considerations related to the acquisition, supply, and utilization of solar energy 14 p0203 A77-29572
- Principles and systems for utilization of solar energy in heating and preparation of hot water 15 p0255 A77-30257
- Calculation of long term solar collector heating system performance 15 p0255 A77-30311
- Design and performance studies on a solar room heater 15 p0255 A77-30314
- Dimensioning of the solar heating system in the Zero Energy House in Denmark 15 p0256 A77-30319
- Economy of tap water heating in summer by means of solar energy 15 p0261 A77-31374
- Efficient energy utilization 15 p0264 A77-31578
- Feasibility of hydrogen production by direct water splitting at high temperature 15 p0279 A77-33372
- A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives 15 p0285 A77-33421
- Sun power: An introduction to the applications of solar energy --- Book 15 p0288 A77-33967
- Calculation of radiation entering 'hot box' solar unit 15 p0291 A77-34975
- Solar heating and cooling systems - A reality today 15 p0292 A77-35154
- Solar energy, its conversion and utilization 15 p0294 A77-35316
- The University of Florida solar house 15 p0294 A77-35317
- Solar cooling of a Florida welcome station - A demonstration 15 p0294 A77-35319
- The economics of industrial process heat from solar energy 15 p0302 A77-36345
- Thermal storage - A sleeping giant 15 p0304 A77-36427
- Solar thermal systems --- solar farm and tower installations for domestic use 15 p0304 A77-36449
- 80 per cent of the heat requirements satisfied by the sun --- in solar house 15 p0304 A77-36450
- Cool it, sun --- space heating and cooling 15 p0305 A77-36627
- Active solar-heating systems for houses 15 p0306 A77-36724
- Solar energy - A part of the answer 15 p0307 A77-36796
- Solar energy - Where are the opportunities --- climate control equipment manufacture 15 p0307 A77-36799
- The economics of solar home heating systems for the southwest region 15 p0309 A77-36824
- Development and testing of solar water-heating boilers manufactured by diffusion welding 15 p0316 A77-37773
- Solar heating in residential houses in Uzbekistan 15 p0316 A77-37774
- Computer model of a solar-assisted heating design approach implemented on a minicomputer installation 15 p0318 A77-38178
- A solar heating system simulation model 15 p0319 A77-38222
- Experimental solar heating-cooling system model tests of a full-scale building system 15 p0319 A77-38224
- Answer House story --- utilizing solar cooling and solar heating 15 p0333 A77-39664
- Solar energy as contribution to the energy budget - Problems of storage 15 p0336 A77-39986
- Calculation and optimization of solar-energy systems which provide hot water 15 p0337 A77-39988
- The BBC Solarwatt system --- for domestic hot water supply 15 p0337 A77-39989
- Possibilities and limitations concerning the economy of solar heating systems 15 p0337 A77-39990
- Thermal storage for electric utilities [AIAA 77-1009] 16 p0403 A77-41556
- Integration of solar generation into electric utility systems [AIAA 77-1020] 16 p0404 A77-41562
- The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- Simulation analysis of passive solar heated buildings - Preliminary results 16 p0406 A77-41582
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587
- The unitary heat pump industry - 25 years of progress 16 p0408 A77-41822
- Solar energy - Promises and pitfalls [AIAA PAPER 77-1022] 16 p0409 A77-41856

Solar electricity - The hybrid system approach  
16 p0413 A77-42556

Study of thermal performance of solar heating  
systems with storage and auxiliary heaters  
16 p0417 A77-42957

Solar heating for a sports complex in Belgium  
16 p0417 A77-42958

Energy budget for the year-round solar  
collector/storage system of a housing cluster  
situated in northern France  
16 p0417 A77-42963

Prefabricated houses with an indoor swimming pool  
heated by a heat pump  
16 p0421 A77-44448

The heat pump - An approach for saving energy  
16 p0421 A77-44450

Autocorrelation and stochastic modelling of  
insolation sequences --- for solar thermal systems  
16 p0422 A77-44479

The architecture of a passive system of diurnal  
radiation heating and cooling  
16 p0423 A77-44488

Lessons learned from Atlanta /towns/ solar  
experiment --- solar heating and cooling for  
school  
16 p0423 A77-44491

Compatible building design --- for solar heating  
retrofits  
16 p0423 A77-44497

A large solar heating system for a Saudi campus  
complex  
16 p0430 A77-46550

Domestic hot water and solar energy in Ireland  
16 p0430 A77-46608

Earth, an open system - The use of solar energy  
16 p0432 A77-46788

Development and testing of solar water-heater  
boilers fabricated by diffusion welding  
16 p0437 A77-47429

Residential solar heating in Uzbekistan  
16 p0437 A77-47430

The test reference year: A collection of hourly  
values of interesting weather elements. III -  
Conversion of the air pressure for other  
altitudes, equations of the vapor pressure of  
water, calculation of the position of the sun  
--- for heating and air conditioning systems  
design  
16 p0441 A77-48258

Thermal scale modeling of the central receiver of  
a helium Brayton cycle solar powerplant  
16 p0445 A77-48717

Solar powered steam generation  
16 p0459 A77-48832

The Page-Jackson Elementary School solar heating  
and cooling system  
16 p0462 A77-48851

Development and implementation of standards for  
solar heating and cooling applications  
16 p0469 A77-48913

Solar residential demonstration program  
16 p0469 A77-48914

Recent Canadian activities in solar heating  
16 p0469 A77-48915

The United States National Program for the  
demonstration of solar heating and cooling in  
buildings - Progress report  
16 p0470 A77-48918

The current technology for solar heating and cooling  
16 p0470 A77-48919

Prospectus on commercialization of solar heating  
and cooling systems  
16 p0470 A77-48920

ERDA/USDA Agricultural Solar Thermal Energy Program  
16 p0470 A77-48921

Thermic diode solar panels - A brief summary  
16 p0472 A77-48936

A method of comparing flat-plate air and liquid  
solar collectors for use in space heating  
applications  
16 p0472 A77-48941

Performance of air-cooled flat plate collectors  
16 p0472 A77-48942

A heat transfer criterion on the geometric  
configuration of flat solar water heaters  
16 p0472 A77-48944

A proposed method of rating the thermal  
performance of solar collectors  
16 p0473 A77-48946

Solar process heat from concentrating flat-plate  
collectors  
16 p0474 A77-48957

Heating of buildings with solar energy  
16 p0474 A77-48959

A solar heated and cooled office building  
16 p0475 A77-48966

Comparative performance of solar heating with air  
and liquid systems  
16 p0475 A77-48967

Experimental evaluation of a solar house heating  
system in Quebec  
16 p0475 A77-48968

Application of solar principles in designing a low  
cost system for warehouse heating  
16 p0476 A77-48969

Lessons learned from Atlanta /Towns/ solar  
experiment --- school building heating and  
cooling system  
16 p0476 A77-48971

Solar cooling of a Florida Welcome Station - A  
demonstration  
16 p0476 A77-48973

The Shenandoah Solar Community Center  
16 p0476 A77-48974

Solar heating for buildings in Ontario -  
Experience and analysis of single, multiple  
residential and commercial low rise buildings  
16 p0476 A77-48975

The Lowell Observatory experimental solar heating  
module  
16 p0476 A77-48976

A competitively-priced solar home, using  
concentrating collectors  
16 p0477 A77-48978

Design and construction of solar space heating and  
hot water supply systems for experimental  
multi-family housing  
16 p0477 A77-48979

Solar heating in northern New England  
16 p0477 A77-48980

A hybrid solar-assisted heat pump system for  
residential applications  
16 p0477 A77-48981

Simulation study of solar heat pump systems  
16 p0477 A77-48982

Solar heating and cooling in a commercial building  
16 p0477 A77-48983

An analysis on optimal design of solar heating and  
cooling system for school  
16 p0477 A77-48984

Operational analysis of a solar optimized heat pump  
16 p0478 A77-48986

Residential solar heating retrofit in the urban  
environment  
16 p0478 A77-48992

Energy conservation through residential solar  
retrofit  
16 p0479 A77-48994

Solar retrofit of a home in Granton, Ontario  
16 p0479 A77-48995

Project Sunshower - San Jose State University  
dormitory retrofit to solar-assisted water heating  
16 p0479 A77-48996

A retrofit solar heating system constructed with  
salvaged and readily available components  
designed for self-installation by low income  
families  
16 p0479 A77-48998

System performance of first residential solar  
installation in Charlottesville, Virginia,  
U.S.A. - Retrofitted indoor swimming pool  
16 p0479 A77-48999

Insolation and temperature statistics and their  
influence on the design of solar heating systems  
and the electric utility interface  
16 p0479 A77-49000

Simulation study of several solar heating systems  
with offpeak auxiliary  
16 p0479 A77-49001

Unified simulation capability for solar heating  
and cooling system analysis  
16 p0479 A77-49003

Performance of a solar heating system utilizing  
phase-change energy storage  
16 p0480 A77-49004

A design procedure for solar air heating systems  
16 p0480 A77-49006

- A simplified method for calculating required solar collector array size for space heating  
16 p0480 A77-49007
- Minimum cost sizing of solar heating systems  
16 p0480 A77-49010
- A structural design process for solar energy systems  
16 p0480 A77-49012
- Microcomputer processor for monitoring of solar heated buildings  
16 p0481 A77-49015
- Cost effective solar heating of houses with seasonal storage of energy  
16 p0481 A77-49016
- Solar thermal system requirements  
16 p0481 A77-49017
- Survey of the applications of solar thermal energy to industrial process heat  
16 p0481 A77-49019
- Shallow solar ponds for industrial process heat - The ERDA-Sohio project  
16 p0482 A77-49024
- Experience with a prototype solar pond for space heating  
16 p0482 A77-49026
- Solar industrial steam  
16 p0482 A77-49029
- Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications  
16 p0483 A77-49031
- Fermi function model absorption profile for solar-thermal conversion  
16 p0483 A77-49035
- Central receiver solar thermal power  
16 p0484 A77-49037
- Application of aluminum alloys for solar heating and cooling systems  
16 p0487 A77-49068
- Gravel and liquid storage system for solar thermal power plants  
16 p0491 A77-49101
- Demand sensitive energy storage in molten salts  
16 p0491 A77-49102
- Inorganic phase change materials for energy storage in solar thermal program  
16 p0492 A77-49103
- Thermal energy storage by the sulfuric acid-water system  
16 p0492 A77-49108
- Thermal energy storage with saturated aqueous solutions  
16 p0493 A77-49111
- Reinforced pillow solar water heater  
16 p0493 A77-49114
- The feasibility of solar house heating - A study in applied economics  
16 p0493 A77-49117
- A parametric study of critical fuel costs for solar heating in North America  
16 p0493 A77-49118
- Incentives and barriers to the development of solar energy  
16 p0494 A77-49119
- Daedalophobia - Diagnosis and prognosis --- solar energy utilization obstacles in Canada  
16 p0494 A77-49121
- Effect of solar home heating on electric utilities  
16 p0494 A77-49123
- Solar energy application considerations for housing in depressed communities  
16 p0494 A77-49126
- Some institutional problems of residential solar heating  
16 p0495 A77-49130
- User needs vs. technical demands, or the art of tradeoff in making a good, inexpensive solar home  
16 p0495 A77-49134
- Report on the design, construction, and marketing of two solar heated SPEC houses  
16 p0496 A77-49141
- Commercialization of solar heating and cooling of buildings  
16 p0496 A77-49142
- Minimum Energy Building - The first winter's operation --- solar heated building  
16 p0496 A77-49144
- The design of a solar cooling and heating system for a commercial building  
16 p0497 A77-49148
- Dual Phase Annual Cycle for residential heating and cooling --- by solar energy  
16 p0497 A77-49149
- Solar economics in Illinois  
16 p0497 A77-49152
- Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists  
16 p0497 A77-49157
- An experimental investigation with artificial sunlight of a solar hot-water heater  
16 p0498 A77-49163
- Initial operation of a solar heating and cooling system in a full-scale solar building test facility  
16 p0498 A77-49164
- On the study of applications of solar thermal energy for mobile homes  
16 p0501 A77-50204
- A design procedure for solar air heating systems  
16 p0501 A77-50209
- Economics of solar heating with homeowner-type financing  
16 p0501 A77-50210
- Heating with solar energy  
16 p0506 A77-51370
- Solar hot water systems application to the solar building test facility and the Tech House  
13 p0084 A77-10342
- CCMS solar energy pilot study solar heating and cooling systems in buildings  
13 p0088 A77-10657
- A location matrix plan for the residential solar heating and cooling demonstration program. Volume 1: Findings and recommendations  
13 p0089 A77-10673
- Hybrid simulation of solar HVAC system for house retro-fit design  
13 p0090 A77-10676
- Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire  
13 p0091 A77-10687
- Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings  
13 p0091 A77-10689
- Commercial building unitary heat pump system with solar heating  
13 p0099 A77-11551
- Temperature distribution of a hot water storage tank in a simulated solar heating and cooling system  
13 p0106 A77-12521
- The feasibility of solar energy usage on Red River Army Depot  
13 p0108 A77-12535
- Method for estimating solar heating and cooling system performance  
13 p0116 A77-13557
- Solar assisted heat pumps: A possible wave of the future  
13 p0121 A77-14584
- LLL-Sohio solar process heat project. Report no. 3: LLL solar energy group  
13 p0123 A77-14604
- Interim feasibility assessment method for solar heating and cooling of Army buildings  
13 p0124 A77-14606
- A design procedure for solar heating systems  
13 p0128 A77-15485
- A performance evaluation of various coatings, substrate materials, and solar collector systems  
13 p0128 A77-15489
- Comparative evaluation of solar heating alternatives  
13 p0129 A77-15498
- The structure of building specifications  
13 p0132 A77-15524
- Intermediate minimum property standards for solar heating and domestic hot water systems  
13 p0132 A77-15525
- Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
14 p0208 A77-16452
- Corrosion inhibitors for solar heating and cooling systems  
14 p0210 A77-17198

- InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 1: National solar demonstration program [COO-2688-76-6-VOL-1] 14 p0224 N77-19632
- InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 2: National solar demonstration program [COO-2688-76-6-VOL-2] 14 p0224 N77-19633
- Solar heating retrofit of military family housing [AD-A030883] 14 p0226 N77-19659
- Potential environmental impacts of solar heating and cooling systems [PB-259570/2] 14 p0226 N77-19683
- Regional variations of solar radiation with application to solar energy system design [PB-259379/6] 14 p0226 N77-19708
- General Electric Company proposed management plan, commercial buildings, National Solar Demonstration Program [COO-2683-76-3] 14 p0229 N77-20568
- General Electric Company proposed demonstration Projects Matrix, commercial buildings, National Solar Demonstration Program [COO-2683-76-5] 14 p0230 N77-20569
- Proposed management plan, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-8] 14 p0230 N77-20570
- Proposed test and evaluation plan, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-9] 14 p0230 N77-20571
- Proposed demonstration Projects Matrix, commercial buildings --- solar heating and cooling demonstration [COO-2683-76-10] 14 p0230 N77-20572
- ERDA solar heating and cooling demonstration program structure [ERDA-76-81] 14 p0230 N77-20573
- Solar energy: L-division miscellanea [UCID-17177] 14 p0231 N77-20590
- Solar industrial steam [UCRL-77895] 14 p0231 N77-20592
- Simple home heating system (what can be done now) [UCRL-77875] 14 p0232 N77-20598
- Design, construction, and testing of a residential solar heating and cooling system [COO-2577-10] 14 p0248 N77-21670
- National program for solar heating and cooling of buildings: Project data summaries. Volume 1: Commercial and residential demonstration [ERDA-76-127] 15 p0346 N77-22639
- Interim performance criteria for solar heating and cooling systems in commercial buildings [PB-262114/2] 15 p0348 N77-22669
- Buying solar --- consumer information [PB-262134/0] 15 p0348 N77-22673
- Solar energy government buildings program policy and implementation plan [PB-262841/0] 15 p0366 N77-24622
- United States special format report: Report of the Phoenix Corporation, city of Colorado Springs Solar Heating Project [SE-4578-76/1] 15 p0373 N77-25647
- A location matrix plan for the residential solar heating and cooling demonstration program. Volume 2: Procedures and appendices [PB-262646/3] 15 p0374 N77-25666
- The effectiveness of solar energy incentives at the state and local level [PB-263371/7] 15 p0375 N77-25670
- Evaluation of initial collector field performance at the Langley Solar Building Test Facility [NASA-TM-X-73677] 15 p0378 N77-26617
- General Electric Company survey to define impact of statewide building codes on solar HVAC systems, commercial buildings. National Solar Demonstration Program [COO-2683-76-11] 15 p0383 N77-26674
- Comparative performance of solar heating with air liquid systems [COO-2868-1] 15 p0383 N77-26676
- Parametric study of critical fuel costs for solar heating in North America [CONF-760842-12] 15 p0392 N77-27533
- Simulation study of several solar heating systems with offpeak auxiliary [CONF-760842-13] 15 p0393 N77-27534
- Performance of a solar heating system utilizing phase-change energy storage. [CONF-760842-11] 15 p0393 N77-27540
- Market evaluation study: Solar domestic water heaters for DOD barracks [AD-A036479] 16 p0516 N77-28611
- Solar house heating system using reflective pyramid optical condensing system [COO-2769-4] 16 p0522 N77-29619
- ERDA/NASA-MSFC solar heating and cooling development and demonstration program 16 p0525 N77-30274
- Assessment of a single-family residence solar heating system in a suburban development setting. Project Phoenix [PB-263192/7] 16 p0530 N77-30632
- The economics of solar home heating [GPO-85-329] 16 p0534 N77-31603
- Economic analysis of solar water and space heating [DSR/2322-1-SUPPL] 16 p0536 N77-31627
- Market evaluation study: Solar heating and domestic hot water heating in DOD buildings [AD-A042178] 16 p0546 N77-32597
- North View Junior High School solar energy demonstration project [PB-267447/1] 16 p0548 N77-32612
- Consumer thermal energy storage costs for residential hot water, space heating and space cooling systems [ANL-K-76-3364-1] 16 p0556 N77-33631
- SOLAR HOUSES**
- Thermal evaluation of a house using a movable-insulation heating and cooling system 13 p0019 A77-12407
- A summary of solar heating and cooling of buildings /SHACOB/ - Phase I demonstration planning studies 13 p0039 A77-12821
- A solar house with heat pipe collectors 13 p0070 A77-18598
- Solar-powered housing unit - Simulation of solar heating and cooling in Saudi Arabia 13 p0078 A77-19110
- Environmentally designed housing incorporating solar energy 13 p0079 A77-19115
- The ASHRAE monograph on applications of solar energy for heating and cooling buildings 14 p0167 A77-23441
- Solar energy retrofit for existing buildings 14 p0168 A77-23444
- Design of a solar heating and cooling system for CSU Solar House II 14 p0181 A77-25902
- Solar heating and cooling of a 25,500 square foot building 14 p0181 A77-26054
- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House 14 p0182 A77-26058
- A data acquisition, performance evaluation and monitoring system for solar heated/cooled residential dwellings [ASME PAPER 76-WA/SOL-13] 14 p0189 A77-26518
- Solar heating and cooling and energy conservation potentials for commercial buildings [ASME PAPER 76-WA/SOL-17] 14 p0189 A77-26522
- The MBB solar houses - Design, operation, and experience 14 p0197 A77-28678
- Solar energy in the building --- French book 15 p0303 A77-36411
- Solar energy - A part of the answer 15 p0307 A77-36796
- Answer House story --- utilizing solar cooling and solar heating 15 p0333 A77-39664
- The Philips energy-experimentation house - Results and experience 15 p0336 A77-39982
- The solar system in the solar house Dornier/RWE in Essen 15 p0336 A77-39983
- The BBC solar house - Design and experience 15 p0336 A77-39984
- The MBB solar houses - Design, operation, and experience 15 p0336 A77-39985

# SUBJECT INDEX

# SOLAR PONDS (HEAT STORAGE)

Heat pumps in solar installations 15 p0337 A77-39987

The BBC Solarwatt system --- for domestic hot water supply 15 p0337 A77-39989

Possibilities and limitations concerning the economy of solar heating systems 15 p0337 A77-39990

The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576

Simulation analysis of passive solar heated buildings - Preliminary results 16 p0406 A77-41582

Solar energy - Promises and pitfalls [AIAA PAPER 77-1022] 16 p0409 A77-41856

The 'wind-wall' - An integrated wind/solar system 16 p0410 A77-42075

The architecture of a passive system of diurnal radiation heating and cooling 16 p0423 A77-44488

Lessons learned from Atlanta /towns/ solar experiment --- solar heating and cooling for school 16 p0423 A77-44491

Earth, an open system - The use of solar energy 16 p0432 A77-46788

Solar energy installation for the project 'Motto di Lena' in Minusio/Tessin 16 p0441 A77-48257

Experimental evaluation of a solar/wind-powered space heating and hot water heating system in the Pacific Northwest 16 p0462 A77-48849

The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report 16 p0470 A77-48918

ERDA/USDA Agricultural Solar Thermal Energy Program 16 p0470 A77-48921

Solar collectors --- for heating and cooling of buildings 16 p0471 A77-48935

Thermic diode solar panels - A brief summary 16 p0472 A77-48936

Cooling subsystem design in CSU Solar House III 16 p0475 A77-48964

A solar heated and cooled office building 16 p0475 A77-48966

Comparative performance of solar heating with air and liquid systems 16 p0475 A77-48967

Experimental evaluation of a solar house heating system in Quebec 16 p0475 A77-48968

A solar home for low income families 16 p0476 A77-48970

Design and construction of a residential solar heating system at Ferilab 16 p0476 A77-48977

A competitively-priced solar home, using concentrating collectors 16 p0477 A77-48978

Solar heating and cooling in a commercial building 16 p0477 A77-48983

Solar assisted heat pump air conditioning system 16 p0477 A77-48985

Operational analysis of a solar optimized heat pump 16 p0478 A77-48986

The solar fan - Solar induced draft air conditioning system 16 p0478 A77-48988

A passive solar heated house - Design and construction 16 p0478 A77-48989

A non-technical evaluation of four different concrete wall solar collector configurations 16 p0478 A77-48990

Climate based solar house design - Hot and humid Charleston, S.C. 16 p0478 A77-48991

A status report on the USAFA solar energy program 16 p0478 A77-48993

Solar retrofit of a home in Granton, Ontario 16 p0479 A77-48995

Solar retrofit applications for public buildings 16 p0479 A77-48997

A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families 16 p0479 A77-48998

Performance of a solar heating system utilizing phase-change energy storage 16 p0480 A77-49004

Microcomputer processor for monitoring of solar heated buildings 16 p0481 A77-49015

A solar/Stirling total energy system 16 p0481 A77-49021

The feasibility of solar house heating - A study in applied economics 16 p0493 A77-49117

Effect of solar home heating on electric utilities 16 p0494 A77-49123

Economic study of solar total energy 16 p0494 A77-49124

Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126

Solar high technology and architecture 16 p0495 A77-49129

Some institutional problems of residential solar heating 16 p0495 A77-49130

Description of Provident House, King City, Ontario 16 p0495 A77-49133

User needs vs. technical demands, or the art of tradeoff in making a good, inexpensive solar home 16 p0495 A77-49134

Perceptual assessment of a new energy concept 16 p0496 A77-49138

The Crain solar house - A case study in the architectural and engineering design process as applied to solar housing for public sale 16 p0496 A77-49140

Report on the design, construction, and marketing of two solar heated SPEC houses 16 p0496 A77-49141

Minimum Energy Building - The first winter's operation --- solar heated building 16 p0496 A77-49144

The performance of homemade solar collectors at the Stockton State College 'Energy House' 16 p0497 A77-49151

Residential application of photovoltaic energy systems 16 p0497 A77-49155

Initial operation of a solar heating and cooling system in a full-scale solar building test facility 16 p0498 A77-49164

Economics of solar heating with homeowner-type financing 16 p0501 A77-50210

Solar energy and the residence - Some systems aspects 16 p0502 A77-50213

Heating with solar energy 16 p0506 A77-51370

Solar house heating system using reflective pyramid optical condensing system [COO-2769-4] 16 p0522 A77-29619

Assessment of a single-family residence solar heating system in a suburban development setting. Project Phoenix [PB-263192/7] 16 p0530 A77-30632

The economics of solar home heating [GPO-85-329] 16 p0534 A77-31603

**SOLAR INSTRUMENTS**

Accelerated response of thermopile pyranometers 13 p0019 A77-12405

Solar properties of materials and testing of solar systems 15 p0294 A77-35318

**SOLAR PONDS (HEAT STORAGE)**

Exploring stability criteria of solar ponds [ASHE PAPER 76-WA/HT-62] 14 p0187 A77-26489

Heat transfer considerations of a nonconvecting solar pond heat exchanger [ASHE PAPER 76-WA/SOL-4] 14 p0188 A77-26509

The economics of industrial process heat from solar energy 15 p0302 A77-36345

## SOLAR POSITION

## SUBJECT INDEX

- Solar ponds - Low cost solar energy management systems 16 p0408 A77-41851
- Stratified density solar collection ponds - Physical factors, results of previous investigations, and suggested experiments 16 p0418 A77-42964
- ERDA Solar Thermal Energy Program for industrial process heat 16 p0470 A77-48922
- Shallow solar ponds for industrial process heat - The ERDA-Schio project 16 p0482 A77-49024
- A generalized numerical model for predicting energy transfers and performance of large solar ponds 16 p0482 A77-49025
- Experience with a prototype solar pond for space heating 16 p0482 A77-49026
- Salt requirement and stability of solar ponds 16 p0482 A77-49027
- Solar pond stability experiments 16 p0482 A77-49028
- Shallow solar ponds for industrial process heat: The ERDA-SOHIO project [UCRL-78288] 14 p0232 N77-20601
- Solar pond [NASA-CASE-NPO-13581-2] 16 p0513 N77-28584
- SOLAR POSITION**
- Design of a tracking system for a solar-energy installation 13 p0015 A77-11919
- An automatic solar disk tracking system for incident energy measurements 14 p0138 A77-20749
- The sun-tracking control of solar collectors using high-performance step motors 15 p0291 A77-35030
- Synergistic effects of shadowing on a solar collector matrix [SAND-76-0012] 13 p0122 N77-14587
- SOLAR RADIATION**
- Energetics of the midlatitude thermosphere 13 p0012 A77-11492
- A method for estimating hourly averages of diffuse and direct solar radiation under a layer of scattered clouds --- for solar collector design 13 p0019 A77-12412
- Survey of quantitative data on the solar energy and its spectra distribution 13 p0072 A77-19044
- Computation of solar radiation design curves 13 p0072 A77-19049
- Regression study of solar radiation and electrical energy consumption 14 p0137 A77-20686
- A mathematical model for the digital computation of the hours of sunshine on an inclined plane 14 p0166 A77-23382
- Meteorological data regarding the utilization of solar energy 14 p0202 A77-29563
- Solar energy systems of the tower type - Arrangement and heat-stability of the receivers and steam generators 15 p0316 A77-37770
- On the theory and solar application of inductive grids --- wave diffraction modeling and far IR measurement 16 p0419 A77-43556
- A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators 16 p0437 A77-47426
- Distribution of direct and total solar radiation availabilities for the USA 16 p0471 A77-48926
- The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation 16 p0501 A77-50206
- Regional variations of solar radiation with application to solar energy system design [PB-259379/6] 14 p0226 N77-19708
- Regional variations of solar radiation with application to solar energy system design, user's manual [PB-259378/8] 14 p0234 N77-20676
- Solar tower characteristics 14 p0237 N77-21562
- Use of radiation reflected from earth to increase the power of solar panels 15 p0363 N77-24586
- Predicting the performance of solar energy systems [AD-A035608] 15 p0373 N77-25660
- Calculation of monthly average insolation on tilted surfaces [CONF-760842-15] 15 p0387 N77-27057
- Solar radiation atmospheric transmission research, phase 1 [PB-266010/8] 16 p0518 N77-28689
- Solar radiation availability for New Mexico [SAND-77-0004] 16 p0558 N77-33654
- SOLAR REFLECTORS**
- A fixed collector employing reversible vee-trough concentrator and a vacuum tube receiver for high temperature solar energy systems 13 p0038 A77-12813
- Standard-size facets for the reflecting surface of a solar concentrator 13 p0063 A77-17557
- A Cassegrain system for solar radiation 13 p0063 A77-17561
- Solergy collector concept --- immobile reflective surface for solar collection using spiral concentrator 13 p0073 A77-19061
- Captation and concentration of solar energy 13 p0074 A77-19063
- Double-reflection solar energy concentrators 13 p0074 A77-19067
- Tower-type solar energy plant - Configuration and energy efficiency of concentrator 14 p0143 A77-21314
- Study of a heliostat system for a solar thermal converter with an energy of 10 MW 14 p0150 A77-21811
- Interaction between the solar mirror field and the thermodynamic system of a turning solar power plant 14 p0151 A77-21824
- Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASHE PAPER 76-WA/HT-10] 14 p0186 A77-26470
- Performance of flat-plate collectors with planar reflectors [ASHE PAPER 76-WA/HT-27] 14 p0186 A77-26478
- Servo positioning power tower collectors for solar heat conversion to electricity 14 p0198 A77-28011
- Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber 14 p0204 A77-29594
- Solar collectors using total internal reflections 14 p0204 A77-29596
- The use of lasers for the inspection of heliotechnical reflectors 15 p0286 A77-33432
- Paraboloid-hyperboloid concentrating systems and their accuracy 15 p0286 A77-33433
- Heat mirrored solar energy receivers [AIAA PAPER 77-728] 15 p0324 A77-39506
- Optimum concentration ratio for a solar central-receiver electric power plant 16 p0409 A77-41865
- Design of pointed solar concentrators 16 p0417 A77-42954
- Optical performance of fixed zenith-moving azimuth paraboloid-cylindrical concentrator 16 p0417 A77-42955
- Low-profile heliostat design for solar central receiver systems 16 p0422 A77-44480
- On the performance of cylindrical parabolic solar concentrators with flat absorbers 16 p0422 A77-44484
- Using lasers to inspect solar-energy reflectors 16 p0427 A77-45545
- Paraboloid-hyperboloid concentrating systems and their accuracy 16 p0427 A77-45546



- Power with heliostats 16 p0433 A77-47174
- The use of planar reflectors for increasing the energy yield of flat-plate collectors 16 p0472 A77-48937
- Performance of an evacuated tubular collector using non-imaging reflectors 16 p0472 A77-48940
- The performance of a stationary reflector/tracking absorber solar concentrator 16 p0474 A77-48954
- Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility 16 p0484 A77-49040
- Prisms with total internal reflection as solar reflectors 16 p0488 A77-49071
- A note of the economics of deep cylindrical mirror concentrating collectors 16 p0502 A77-50218
- Solar energy collection system [NASA-CASE-NPO-13579-2] 14 p0229 N77-20565
- Low cost solar energy collection system [NASA-CASE-NPO-13579-3] 14 p0229 N77-20566
- Solar industrial steam [UCRL-77895] 14 p0231 N77-20592
- Prisms with total internal reflection as solar reflectors [ANL-SOL-76-04] 15 p0345 N77-22629
- Lightweight reflector assembly [NASA-CASE-NPO-13707-1] 16 p0518 N77-28933
- Solar house heating system using reflective pyramid optical condensing system [COO-2769-4] 16 p0522 N77-29619
- SOLAR SAILS**
- Solar sails --- for radiation pressure displacement guidance 15 p0267 A77-32215
- SOLAR SEA POWER PLANTS**
- Electricity from the thermal power of the sea 14 p0176 A77-24218
- Solar power from the oceans --- ocean thermal energy conversion 14 p0190 A77-26724
- The OTEC answer to OPEC - Solar sea power 15 p0303 A77-36409
- Sea water - The energy elixir --- ocean thermal, tide and wave energy conversion 15 p0320 A77-38446
- A comparison of the economics of nuclear and solar power 16 p0485 A77-49049
- Design and modeling of solar sea power plants by geometric programming [COO-2895-T1] 14 p0231 N77-20585
- SOLAR SENSORS**
- The advantages of sun tracking for planar silicon solar cells 14 p0181 A77-25904
- A self-contained solar powered tracking device [ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477
- Sun tracking solar energy collector [NASA-CASE-NPO-13921-1] 15 p0363 N77-24590
- SOLAR SIMULATION**
- The role of simulation in the development of solar-thermal energy conversion systems 13 p0037 A77-12809
- Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297
- Solar powered absorption cycle simulation using real and stochastic weather data [ASME PAPER 76-WA/SOL-6] 14 p0188 A77-26511
- Preliminary report on simulation of a heliostat field [ERDA-TB-158] 14 p0226 N77-19782
- SOLAR SIMULATORS**
- Performance rating of photovoltaic solar generators for terrestrial applications 14 p0153 A77-21837
- The determination of the performance characteristics of solar collectors 14 p0203 A77-29573
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161
- An experimental investigation with artificial sunlight of a solar hot-water heater 16 p0498 A77-49163
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator [NASA-TN-X-73520] 13 p0097 N77-11530
- Standardized performance tests of collectors of solar thermal energy: An evacuated flatplate copper collector with a serpentine flow distribution [NASA-TN-X-73415] 13 p0114 N77-13536
- Consideration of design and calibration of terrestrial reference solar cells 16 p0527 N77-30531
- SOLAR SPECTRA**
- The solar spectrum at typical clear weather days --- for optimal energy conversion cell performance 16 p0501 A77-50212
- SOLAR SYSTEM**
- Introduction: Man and his total environment 16 p0544 N77-32554
- SOLENOIDS**
- The laser solenoid - An alternate use of lasers in fusion power 14 p0198 A77-28962
- Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids 16 p0411 A77-42160
- Electron beam heated solenoid reactors for fusion power and fissile fuel breedings 16 p0459 A77-48827
- SOLID PHASES**
- Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106
- SOLID SOLUTIONS**
- Thermoelectric power of pseudoternary solid solutions 13 p0014 A77-11917
- SOLID STATE**
- Symposium on the Fundamental Optical Properties of Solids Relevant to Solar Energy Conversion [PB-256615/6] 13 p0108 N77-12538
- Some studies on a solid state sulfur probe for coal gasification systems [NASA-TN-78428] 16 p0534 N77-31605
- SOLID STATE DEVICES**
- Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station /GSS4PS/ [AIAA PAPER 77-511] 14 p0173 A77-23927
- SOLID STATE PHYSICS**
- Basic mechanisms governing solar-cell efficiency 16 p0486 A77-49060
- SOLID WASTES**
- Energy from solid wastes --- Book 13 p0003 A77-10698
- Controlled tipping of combustion residues 13 p0008 A77-11175
- Dutchess County, NY moves towards pyrolysis --- of solid wastes with fuel recovery 13 p0010 A77-11298
- Fuel gas recovery from controlled landfilling of municipal wastes 13 p0070 A77-18739
- Demonstration of pyrolysis and materials recovery in San Diego, California 14 p0137 A77-20521
- An analysis of the role of energy in solid waste utilization and disposal 14 p0182 A77-26070
- Drying of refuse-derived fuel for energy recovery from municipal solid waste 14 p0182 A77-26071
- Methane gas recovery from sanitary landfills in Southern California 14 p0182 A77-26077
- Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078
- New life for old garbage - Resource and energy recovery from solid wastes 14 p0199 A77-29096
- Solid waste incineration and energy recovery in hospitals 15 p0272 A77-33283

- Municipal solid waste recovery - A public or private risk 15 p0273 A77-33299
- Synthetic fuels from solid wastes and solar energy 15 p0275 A77-33336
- Recovering metal from trash 15 p0287 A77-33529
- Use of municipal waste for fuel 15 p0291 A77-35149
- Refuse to energy Memphis style 15 p0292 A77-35156
- Recovering resources from urban refuse by the Bureau of Mines processes 15 p0292 A77-35158
- Energy recovery from solid waste using the Union Carbide Furcx system 15 p0292 A77-35159
- The Garrett oil-from-waste process and resource recovery system 15 p0293 A77-35162
- Torrax - A system for recovery of energy from solid waste. F. J. Page 15 p0293 A77-35163
- District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164
- Decision making in the utilisation of the organic fraction of municipal wastes 15 p0299 A77-36272
- Economic feasibility of the conversion of organic waste to fuel oil and pipeline gas 15 p0302 A77-36346
- Regional energy availability from conversion of solid waste 15 p0304 A77-36433
- Energy recovery from municipal and industrial waste 15 p0305 A77-36605
- EPA resource recovery demonstration - Summary of air emissions analyses 15 p0313 A77-37630
- Municipal solid waste as a resource for energy recovery and conservation 15 p0313 A77-37655
- Union Electric Company's 8000 ton per day solid waste utilization system 15 p0313 A77-37656
- SMG from refuse and sewage sludge by the BIOGAS process 15 p0314 A77-37659
- EPA's program in environmental research in wastes-as-fuel 15 p0315 A77-37668
- Environmental studies of the St. Louis-Union Electric refuse firing demonstration 15 p0315 A77-37669
- The PUROX System --- solid waste partial oxidation to fuel gas 15 p0315 A77-37671
- Packed bed digestion of solid wastes 15 p0323 A77-39107
- Energy recovery by the incineration of solid waste - Development, present status and experiences in Germany 15 p0334 A77-39675
- Energy from bioconversion of waste materials --- Book 16 p0407 A77-41649
- 'Co-disposal' for solid wastes and sewage sludge 16 p0427 A77-45873
- Energy from solid waste utilization; Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, University of Rhode Island, Kingston, R.I., July 8, 9, 1975 16 p0433 A77-47210
- Economics of solid waste conversion 16 p0433 A77-47211
- Potential alternative fuel derivatives from municipal solid wastes 16 p0433 A77-47213
- A supplementary fuel for power generation /Ases, Iowa/ --- solid waste recovery system 16 p0433 A77-47214
- Energy and resource recovery from solid wastes 16 p0434 A77-47215
- Fluidized-bed incineration of waste materials 16 p0434 A77-47216
- Methane production from solid waste 16 p0434 A77-47218
- Modern incineration - A proven way for recovery of energy and metals 16 p0434 A77-47220
- Steam recovery - An alternative for intermediate size regions --- solid waste disposal 16 p0434 A77-47222
- Thermal processing of municipal solid waste for resource and energy recovery --- Book 16 p0438 A77-47951
- Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- Study of the feasibility of federal procurement of fuels produced from solid wastes [PB-255695/9] 13 p0096 N77-11513
- A bioenvironmental study of emissions from refuse derived fuel [AD-A024661] 13 p0110 N77-12571
- Evaluation of pollution control in fossil fuel conversion processes [PB-255842/7] 13 p0125 N77-14638
- Performance of emission control devices on boilers firing municipal solid waste and oil [PB-257136/2] 13 p0133 N77-15550
- Fine shredding of municipal solid waste [PB-257105/7] 13 p0133 N77-15919
- Environmental effects of solid waste as a supplemental fuel [IS-3852] 14 p0211 N77-17567
- Study of the feasibility of a regional solid waste derived fuel system in the Tennessee Valley Authority service area [PB-259764/9] 14 p0227 N77-19956
- Energy recovery from solid waste: A review of current technology [PB-260633/3] 14 p0253 N77-22016
- Solid waste as an energy source for the northeast [BNL-50559] 15 p0352 N77-23012
- Energy recovery through biogasification of municipal solid wastes and utilization of thermal wastes from an energy-urban-agro-waste complex 15 p0358 N77-24008
- Energy recovery from municipal solid waste, an environmental and safety mini-overview survey [ATR-76(7518)-7] 15 p0369 N77-25011
- The potential for reusable homogeneous containers [PB-265100/8] 16 p0518 N77-29007
- Physical properties of western coal waste materials [PB-266724/4] 16 p0530 N77-30657
- Reclamation of energy from solid waste: Theory and practice. A selected, annotated bibliography for Pennsylvania local government officials [PB-267800/1] 16 p0555 N77-33621
- SOLID-SOLID INTERFACES**
- Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818
- Theory of the Schottky barrier solar cell 15 p0266 A77-32116
- SOLIDS**
- Synthetic fuels from solid wastes and solar energy 14 p0237 N77-21565
- Operation of military field heating equipment using solid fuels [AD-A037121] 15 p0388 N77-27152
- SOLUBILITY**
- A simple approach to metal hydride alloy optimization 15 p0281 A77-33388
- SOLVENT EXTRACTION**
- Mechanisms of coal particle dissolution 13 p0059 A77-16475
- Gasification of coals treated with non-aqueous solvents. I - Liquid ammonia treatment of a bituminous coal 14 p0198 A77-28778
- Coal particle integrity in high-temperature solvents, with and without agitation 16 p0401 A77-41317
- Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures 16 p0412 A77-42406
- Charge characteristics of particles in coal derived liquids - Measurement and origin 16 p0412 A77-42408

- Laboratory analysis of solvent refined coal  
[PB-255550/6] 13 p0110 N77-12598
- Investigating storage, handling, and combustion characteristics of solvent refined coal  
[PB-257557/9] 14 p0212 N77-17595
- Solubilization of coal in organic media  
[NASA-TN-75151] 15 p0390 N77-27498
- SOLVENTS**  
Startup solvent selection for the liquefaction of lignite 13 p0059 A77-16472
- SOOT**  
Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio 15 p0293 A77-35186
- SORBENTS**  
Hydrogen separation and production from coal-derived gases using Fe/x/TiNi/1-x/ 16 p0458 A77-48821
- SOUTH CAROLINA**  
Evaluation and targeting of geothermal energy resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642
- SOUTHERN CALIFORNIA**  
Methane gas recovery from sanitary landfills in Southern California 14 p0182 A77-26077
- Project SAGE: Solar Assisted Gas Energy Project. United States special format report  
[DSE/4691-76/1] 16 p0522 N77-29614
- SPACE BASES**  
Space construction base support requirements for environmental control and life support systems  
[ASME PAPER 77-ENAS-44] 16 p0432 A77-46885
- Space construction base operations in support of solar power satellite development 16 p0468 A77-48907
- SPACE CHARGE**  
A direct converter based upon space charge effects 14 p0184 A77-26160
- SPACE COLONIES**  
Space: A resource for earth - An AIAA review --- Book 15 p0269 A77-32440
- Space manufacturing facilities: Space colonies; Proceedings of the Princeton Conference, Princeton University, Princeton, N.J., May 7-9, 1975 15 p0295 A77-35801
- Deep space material sources --- from asteroids for space colonies 15 p0295 A77-35805
- Near-term chemically-propelled space transport systems --- to space colonies 15 p0295 A77-35810
- On the realisation of projects - With special reference to O'Neill space colonies and the like 16 p0431 A77-46770
- A preliminary cost benefit analysis of space colonization 16 p0431 A77-46771
- Where do we locate the moon base --- considering polar regions as preferred lunar observatory sites 16 p0504 A77-51023
- International law and the use of outer space for the production of solar power  
[IAP PAPER SL-77-62] 16 p0508 A77-51565
- SPACE ELECTRIC ROCKET TESTS**  
Status of SERT 2 thrusters and spacecraft 1976  
[NASA-TN-X-73501] 13 p0083 N77-10149
- SPACE ERECTABLE STRUCTURES**  
Fabrication and assembly of large composite structures in space  
[AIAA PAPER 77-543] 15 p0266 A77-32065
- Large-scale space operations for Solar Power Satellites  
[AIAA PAPER 77-1031] 16 p0413 A77-42483
- Space power stations - Space construction, transportation, and pre-development, space project requirements  
[IAP PAPER 77-64] 16 p0506 A77-51415
- The assembly of large structures in space --- radio astronomy telescope and microwave antenna 16 p0524 N77-29770
- Space station systems analysis study. Part 3: Documentation. Volume 1: Executive summary  
[NASA-CR-151503] 16 p0525 N77-30151
- SPACE FLIGHT**  
NASA authorization, 1978, volume 1, part 2  
[GPO-92-082] 16 p0542 N77-32031
- SPACE LAW**  
Legal and economic prerequisites to space industrialization  
[IAP PAPER ISL-76-29] 13 p0004 A77-10968
- Energy - Ecospace --- space law aspects of U.S. and U.S.S.R. solar power proposals  
[IAP PAPER ISL-76-59] 13 p0004 A77-10970
- National Meeting on Air and Space Law, 7th, Universidad Nacional de Cordoba, Cordoba and La Palda, Argentina, August 13-16, 1975, Proceedings 13 p0053 A77-15050
- International law and solar energy satellites  
[IAP PAPER SL-77-52] 16 p0508 A77-51561
- International law and the use of outer space for the production of solar power  
[IAP PAPER SL-77-62] 16 p0508 A77-51565
- SPACE MANUFACTURING**  
Legal and economic prerequisites to space industrialization  
[IAP PAPER ISL-76-29] 13 p0004 A77-10968
- The construction of satellite solar power stations from non-terrestrial materials  
[AIAA PAPER 77-354] 13 p0066 A77-18259
- Mass driver retrievals of earth-approaching asteroids --- earth orbit capture for mining purposes  
[AIAA PAPER 77-528] 15 p0265 A77-32053
- Environmental impact of space manufacturing  
[AIAA PAPER 77-539] 15 p0266 A77-32062
- Fabrication and assembly of large composite structures in space  
[AIAA PAPER 77-543] 15 p0266 A77-32065
- Vapor-phase fabrication of massive structures in space  
[AIAA PAPER 77-542] 15 p0270 A77-32597
- Space manufacturing facilities: Space colonies; Proceedings of the Princeton Conference, Princeton University, Princeton, N.J., May 7-9, 1975 15 p0295 A77-35801
- Industrial development in zero-G 15 p0295 A77-35812
- The next 25 years: Industrialization of space - Rationale for planning 15 p0322 A77-38792
- Mining the Apollo and Amor asteroids 16 p0400 A77-40648
- New themes for space: Mankind's future needs and aspirations; Proceedings of the Bicentennial Space Symposium, Washington, D.C., October 6-8, 1976 16 p0430 A77-46627
- The space station and space industrialization  
[AAS 76-050] 16 p0430 A77-46633
- Composites for large space structures  
[IAP PAPER 77-65] 16 p0507 A77-51416
- Socio-economic determinants of a program for lunar industrialization in support of space light development Lunetta and Soletta  
[IAP PAPER A-77-66] 16 p0507 A77-51533
- A review of the solar array manufacturing industry costing standards  
[NASA-CR-153401] 16 p0528 N77-30608
- SPACE MISSIONS**  
Energy storage in orbital and interplanetary missions  
[DGLR PAPER 76-189] 13 p0059 A77-16551
- A new cycle for optimum energy storage in interplanetary missions  
[IAP PAPER 77-141] 16 p0507 A77-51444
- SPACE POWER REACTORS**  
Heat pipe nuclear reactor for space power 13 p0036 A77-12797
- Reactor hybrid-Organic Rankine Cycle Electric Power Systems /ORCEPS/ for space applications 16 p0463 A77-48858
- Technology for power in space 16 p0463 A77-48865
- Experimental evaluation of a breadboard heat and product-water removal system for a space-power fuel cell designed with static water removal and evaporative cooling  
[NASA-TN-D-8485] 15 p0363 N77-24592
- SPACE PROCESSING**  
Industrial development in zero-G 15 p0295 A77-35812

- Space applications for terrestrial resources  
15 p0320 A77-38477
- The next 25 years: Industrialization of space -  
Rationale for planning  
15 p0322 A77-38792
- Energy conditions of welding with solar radiation  
16 p0421 A77-44274
- Orbital construction support equipment  
[NASA-CR-151460]  
15 p0388 N77-27157
- SPACE PROGRAMS**  
Space Congress, 14th, Cocoa Beach, Fla., April  
27-29, 1977, Proceedings  
15 p0294 A77-35301
- SPACE SHUTTLES**  
Small space station electrical power system design  
concepts  
13 p0040 A77-12835
- The Tethered Balloon Current Generator - A space  
shuttle-tethered subsatellite for plasma studies  
and power generation  
14 p0184 A77-26200
- Space solar power - The transportation challenge  
--- for Space Shuttle  
[AIAA PAPER 77-529]  
15 p0266 A77-32054
- Fabrication and assembly of large composite  
structures in space  
[AIAA PAPER 77-543]  
15 p0266 A77-32065
- Space shuttle missions of the 80's; Proceedings of  
the Twenty-first Annual Meeting, Denver, Colo.,  
August 26-28, 1975. Parts 1 & 2  
15 p0304 A77-36526
- Satellite power system: Engineering and economic  
analysis summary  
[NASA-TM-X-73344]  
13 p0128 N77-15486
- SPACE STATIONS**  
The space station and space industrialization  
[AAS 76-050]  
16 p0430 A77-46633
- Space construction base support requirements for  
environmental control and life support systems  
[ASME PAPER 77-ENAS-44]  
16 p0432 A77-46885
- Composites for large space structures  
[IAF PAPER 77-65]  
16 p0507 A77-51416
- Electromechanical stabilization system  
16 p0511 N77-28211
- Space station systems analysis study. Part 3:  
Documentation. Volume 1: Executive summary  
[NASA-CR-151503]  
16 p0525 N77-30151
- NASA authorization, 1978, volume 1, part 3  
[GPO-92-294]  
16 p0542 N77-32032
- Solar power satellite. Concept evaluation.  
Activities report. Volume 2: Detailed report  
[NASA-TM-74942]  
16 p0552 N77-33600
- SPACE TRANSPORTATION**  
Transportation options for solar power satellites  
13 p0040 A77-12829
- Mass driver retrievals of earth-approaching  
asteroids --- earth orbit capture for mining  
purposes  
[AIAA PAPER 77-528]  
15 p0265 A77-32053
- Near-term chemically-propelled space transport  
systems --- to space colonies  
15 p0295 A77-35810
- Space shuttle missions of the 80's; Proceedings of  
the Twenty-first Annual Meeting, Denver, Colo.,  
August 26-28, 1975. Parts 1 & 2  
15 p0304 A77-36526
- A space station for the 1980's - A look at the  
next generation of operational systems and their  
functional requirements  
[ASME PAPER 77-ENAS-37]  
16 p0432 A77-46878
- NASA Office of Aeronautics and Space Technology  
Summer Workshop. Volume 4: Power technology  
panel  
[NASA-TM-X-73964]  
13 p0117 N77-13913
- Technology requirements for advanced earth-orbital  
transportation systems: Summary report ---  
single stage to orbit vehicles  
[NASA-CR-2867]  
16 p0550 N77-33255
- SPACE TOGS**  
Space shuttle missions of the 80's; Proceedings of  
the Twenty-first Annual Meeting, Denver, Colo.,  
August 26-28, 1975. Parts 1 & 2  
15 p0304 A77-36526
- SPACEBORNE ASTRONOMY**  
New themes for space: Mankind's future needs and  
aspirations; Proceedings of the Bicentennial  
Space Symposium, Washington, D.C., October 6-8,  
1976  
16 p0430 A77-46627
- SPACEBORNE PHOTOGRAPHY**  
Cross structural plan of the earth's crust and the  
problem of the manifestation of its plutonic  
elements on the surface (Tyan-Shan and Turan  
plate as examples)  
[NASA-TT-F-16938]  
13 p0117 N77-13590
- SPACEBORNE TELESCOPES**  
The assembly of large structures in space ---  
radio astronomy telescope and microwave antenna  
16 p0524 N77-29770
- SPACECRAFT CONFIGURATIONS**  
SEP full-scale wing technology development  
16 p0463 A77-48860
- SPACECRAFT CONSTRUCTION MATERIALS**  
The construction of satellite solar power stations  
from non-terrestrial materials  
[AIAA PAPER 77-354]  
13 p0066 A77-18259
- Solar sails --- for radiation pressure  
displacement guidance  
15 p0267 A77-32215
- Composites for large space structures  
[IAF PAPER 77-65]  
16 p0507 A77-51416
- SPACECRAFT DESIGN**  
SEP solar array technology development  
13 p0040 A77-12825
- The nuclear spinner for Satcom applications ---  
comparing nuclear and solar power supplies  
13 p0041 A77-12838
- Advanced low-mass solar array technology  
[AIAA PAPER 77-488]  
14 p0173 A77-23908
- Re-entrant groove heat pipe --- computerized  
design for OAO applications  
[AIAA PAPER 77-773]  
15 p0312 A77-37280
- Thermal energy management techniques in spacecraft  
design and their potential for terrestrial  
applications  
16 p0439 A77-47969
- Space power stations - Space construction,  
transportation, and pre-development, space  
project requirements  
[IAF PAPER 77-64]  
16 p0506 A77-51415
- SPACECRAFT GUIDANCE**  
An energy management guidance scheme applicable to  
the interim upper stage --- for orbital transfer  
maneuvers  
[AD-A034005]  
15 p0353 N77-23143
- SPACECRAFT LUBRICATION**  
Thermally induced migration of hydrocarbon oil  
15 p0268 A77-32375
- SPACECRAFT MODULES**  
The space station and space industrialization  
[AAS 76-050]  
16 p0430 A77-46633
- SPACECRAFT MOTION**  
Nuclear-powered Hysat spacecraft: Comparative  
design study  
[ERDA-SNS-3063-8]  
13 p0094 N77-11108
- SPACECRAFT PERFORMANCE**  
SEP solar array technology development  
13 p0040 A77-12825
- Comparison of candidate solar array maximum power  
utilization approaches --- for spacecraft  
propulsion  
13 p0041 A77-12836
- SNAP 19 Viking RTG mission performance  
13 p0041 A77-12840
- Anik B, the new Canadian domestic satellite  
16 p0499 A77-49249
- SPACECRAFT POWER SUPPLIES**  
Uranium zirconium hydride reactor space power  
systems  
[IAF PAPER 76-256]  
13 p0004 A77-10953
- Isotope heat source for dynamic power systems  
13 p0036 A77-12796
- The ATS-6 power system - Hardware implementation  
and orbital performance  
13 p0040 A77-12831
- Power source requirements of electric propulsion  
systems used for north-south stationkeeping of  
communication satellites  
13 p0040 A77-12833
- KIPS - Kilowatt Isotope Power System --- for use  
in satellites  
13 p0041 A77-12837
- The nuclear spinner for Satcom applications ---  
comparing nuclear and solar power supplies  
13 p0041 A77-12838
- SNAP 19 Viking RTG mission performance  
13 p0041 A77-12840

# SUBJECT INDEX

# SPECTRAL REFLECTANCE

Spherical radioisotope thermoelectric generators -  
 An approach to high specific power devices 13 p0042 A77-12857

Fuel cells --- electrochemical energy conversion 13 p0055 A77-15804

Radiation effects on high efficiency silicon solar cells 13 p0064 A77-18072

Alkali metal space power technology applicable to national energy research and development [AIAA PAPER 77-289] 13 p0065 A77-18223

The economic viability of pursuing a space power system concept [AIAA PAPER 77-353] 13 p0066 A77-18258

Space battery technology for the 1980s [AIAA PAPER 77-482] 14 p0172 A77-23902

Status of the NASA Space Power Program [AIAA PAPER 77-505] 14 p0173 A77-23922

Solar cell equipment with concentrating mirrors and radiator surfaces 15 p0324 A77-39494

Electrochemical energy conversion. II - Utilities, marine and space applications 16 p0400 A77-40686

Radiation effects on high efficiency silicon solar cells --- for spacecraft application 16 p0416 A77-42892

The electrical power system for Spacelab 16 p0432 A77-46789

Tests and evaluation of multihundred watt thermoelectric generators at JPL 16 p0462 A77-48854

Design of a spherical RTG --- Radioisotope Thermoelectric Generators 16 p0462 A77-48857

Reactor hybrid-Organic Rankine Cycle Electric Power Systems /ORCEPS/ for space applications 16 p0463 A77-48858

Technology for power in space 16 p0463 A77-48865

Past experience - Basis for future advanced power systems for communications satellites [IAF PAPER 77-22] 16 p0506 A77-51390

A new cycle for optimum energy storage in interplanetary missions [IAF PAPER 77-141] 16 p0507 A77-51444

Automatic optimization of operating modes in thermionic electrical power generators [IAF PAPER 77-142] 16 p0507 A77-51445

Test program for transmitter experiment package and heat pipe system for the communications technology satellite [NASA-TN-X-3455] 13 p0095 N77-11268

NASA Office of Aeronautics and Space Technology Summer Workshop. Volume 4: Power technology panel [NASA-TN-X-73964] 13 p0117 N77-13913

The ATS-6 power system: Hardware implementation and orbital performance [NASA-TP-1023] 16 p0543 N77-32229

**SPACECRAFT PROPULSION**

Laser propulsion --- rocket heat engine design [IAF PAPER 76-166] 13 p0003 A77-10931

UK, T5 ion engine thrust vector control considerations [AIAA PAPER 76-1064] 13 p0045 A77-13030

Energy storage in orbital and interplanetary missions [DGLR PAPER 76-189] 13 p0059 A77-16551

Near-term chemically-propelled space transport systems --- to space colonies 15 p0295 A77-35810

Advanced fuel fusion application to manned space propulsion 16 p0436 A77-47367

Extraterrestrial resources and astronautics --- Russian book 16 p0499 A77-49400

Future space experiments with levitated capacitor for thermonuclear microexplosions [IAF PAPER 77-ST-11] 16 p0508 A77-51575

Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies [AD-A034995] 15 p0377 N77-26491

Technology requirements for advanced earth-orbital transportation systems: Summary report --- single stage to orbit vehicles [NASA-CR-2867] 16 p0550 N77-33255

## SPACECRAFT RADIATORS

Status of development and application of gas-stabilized heat-pipe radiators [DGLR PAPER 76-192] 13 p0060 A77-16557

Axially grooved heat pipes - 1976 [AIAA PAPER 77-747] 15 p0324 A77-39512

Development of a low temperature phase change material package --- for spacecraft thermal control [AIAA PAPER 77-762] 15 p0325 A77-39514

Heat pipes, volume 2 --- conference proceedings, Bologna, 31 Mar. - 2 Apr. 1976 [ESA-SP-112-VOL-2] 13 p0119 N77-14378

Extended cryogenic performance of Lobar Wick heat pipe/radiator 13 p0119 N77-14379

Heat pipe and space radiator developments 13 p0120 N77-14391

## SPACECRAFT STABILITY

Gravitationally stabilized satellite solar power station in orbit 14 p0196 A77-28421

## SPACELAB

Space shuttle missions of the 80's; Proceedings of the Twenty-first Annual Meeting, Denver, Colo., August 26-28, 1975. Parts 1 & 2 15 p0304 A77-36526

The electrical power system for Spacelab 16 p0432 A77-46789

AMPS - subsatellite assessment study, volume 1 [ASB-ORV-91-76-VOL-1] 15 p0354 N77-23175

## SPARK GAPS

Increasing the electrical strength of the interelectrode gap in an MHD generator 16 p0428 A77-46091

## SPARK IGNITION

A guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines 13 p0033 A77-12779

Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases 14 p0195 A77-28050

Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine 16 p0444 A77-48706

Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines [TEER-1036] 16 p0511 N77-28324

## SPATIAL DISTRIBUTION

Use of a Lowry-type spatial allocation model in an urban transportation energy study 15 p0265 A77-31899

## SPECIFIC HEAT

Thermal energy storage by the sulfuric acid-water system 16 p0492 A77-49108

Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire [AD-A031803] 14 p0228 N77-20393

## SPECIFIC IMPULSE

Laser propulsion --- rocket heat engine design [IAF PAPER 76-166] 13 p0003 A77-10931

## SPECIFICATIONS

Technology evaluation report, commercial buildings [COO-2683-76-1] 14 p0232 N77-20603

## SPECTRAL ENERGY DISTRIBUTION

Thermodynamic constraints, effective temperatures and solar cells 14 p0147 A77-21779

The solar spectrum at typical clear weather days --- for optimal energy conversion cell performance 16 p0501 A77-50212

Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219

Effects of spectral variations on silicon cell output [SAND-76-9142] 15 p0381 N77-26653

**SPECTRAL REFLECTANCE**

Progress in development and application of selective surfaces --- for solar collectors 13 p0072 A77-19052

Ellipsometry in the study of selective radiation-absorbing surfaces --- for solar energy 16 p0406 A77-41581

## SPECTRAL SENSITIVITY

## SUBJECT INDEX

- Spectral reflectance of TiN/x/ and ZrN/x/ films as selective solar absorbers 16 p0423 A77-44492
- Reflection coefficient for a back-surface glass mirror --- of solar collectors 16 p0488 A77-49072
- SPECTRAL SENSITIVITY**  
Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219
- SPECTRUM ANALYSIS**  
Raman scattering and the characterization of atmospheric aerosol particles 15 p0262 A77-31487
- SPECULAR REFLECTION**  
Performance of low cost solar reflectors for transferring sunlight to a distant collector 14 p0180 A77-25896
- Low reflectivity solar cells [AD-A025922] 13 p0108 N77-12539
- SPEED CONTROL**  
Amtrak's newest turboliners 14 p0138 A77-20699
- SPHERICAL SHELLS**  
Optical study of fixed spherical solar collectors 16 p0505 A77-51161
- SPIN STABILIZATION**  
Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station /GSS4PS/ [AIAA PAPER 77-511] 14 p0173 A77-23927
- SPINNERS**  
The nuclear spinner for Satcom applications --- comparing nuclear and solar power supplies 13 p0041 A77-12838
- SPIRALS (CONCENTRATORS)**  
Solergy collector concept --- immobile reflective surface for solar collection using spiral concentrator 13 p0073 A77-19061
- SPRAYED COATINGS**  
Analytical and experimental treatment of a spray-on selective coating - Application to collector design 16 p0487 A77-49064
- Efficient sprayed In2O3:Sn n-type silicon heterojunction solar cell 16 p0503 A77-50292
- SPRINGS (WATER)**  
A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs 13 p0014 A77-11591
- Utilization of heat of geothermal springs and waste hot waters in freon-operated power plants 14 p0175 A77-24207
- SPUTTERING**  
Selective black absorbers using RF-sputtered Cr2O3/Cr cermet films 15 p0265 A77-31951
- STABILITY DERIVATIVES**  
Electromechanical stabilization system 16 p0511 A77-28211
- STABILIZATION**  
Investigation of excitation control for wind-turbine generator stability [NASA-TN-73745] 16 p0535 A77-31614
- STACKS**  
Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer 13 p0062 A77-17541
- Determination of SO2 concentrations from a coal-burning power plant stack by Fourier spectrometry 15 p0296 A77-36024
- Stack gas cleanup --- scrubber systems for high-sulfur coal 15 p0317 A77-37939
- Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants 16 p0420 A77-44178
- Fuel cell stacks [AD-A037586] 15 p0380 A77-26641
- STAINLESS STEELS**  
Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems 15 p0337 A77-40028
- Corrosion behavior of materials for coal-gasification applications 15 p0337 A77-40029
- Metal dusting corrosion in coal gasification environments 15 p0337 A77-40042
- Stainless steel panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-2] 16 p0535 A77-31611
- STANDARDIZATION**  
Standards support and environmental impact statement. Volume 1: Proposed standards of performance for petroleum refinery sulfur recovery plants [PB-257975/3] 14 p0213 N77-17647
- Development of standardized specifications for silicon solar cells [NASA-CR-135233] 16 p0520 A77-29604
- STANDARDS**  
Development and implementation of standards for solar heating and cooling applications 16 p0469 A77-48913
- Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- Design guidelines for energy conserving systems [PB-268989/1] 16 p0559 A77-33670
- STANNATES**  
Evaluation of cadmium stannate films for solar heat collectors 14 p0198 A77-29021
- Cadmium stannate selective optical films for solar energy applications [PB-254879/0] 13 p0090 A77-10678
- Cadmium stannate selective optical films for solar energy applications [PB-261850/2] 15 p0348 A77-22672
- STAR TRACKERS**  
The advantages of sun tracking for planar silicon solar cells 14 p0181 A77-25904
- STARTING**  
Some features of start-up of alkali metal heat pipes 13 p0119 A77-14383
- STATIC TESTS**  
Static and wind-on tests of an upper-surface-blown jet-flap nozzle arrangement for use on the Quiet Clean Short-haul Experimental Engine (QCSSE) [NASA-TN-D-8476] 15 p0370 A77-25086
- STATIONARY ORBITS**  
Perspectives on Satellite Solar Power [AIAA PAPER 77-352] 13 p0066 A77-18257
- Captation and concentration of solar energy 13 p0074 A77-19063
- Advanced photovoltaic power systems [AIAA PAPER 77-506] 14 p0173 A77-23923
- STATIONKEEPING**  
Power source requirements of electric propulsion systems used for north-south stationkeeping of communication satellites 13 p0040 A77-12833
- UK, T5 ion engine thrust vector control considerations [AIAA PAPER 76-1064] 13 p0045 A77-13030
- STATISTICAL ANALYSIS**  
Higher electric power use reduces energy consumption for same gross national product 13 p0011 A77-11334
- Concerning world oil resources. II - Statistical logistic models /King Hubbert's models/ 13 p0011 A77-11339
- Analysis of a Delphi study on hydrogen --- questionnaire survey on future energy utilization 15 p0284 A77-33411
- Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions 15 p0286 A77-33435
- Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia 16 p0427 A77-45548

# SUBJECT INDEX

# STIRLING CYCLE

- Energy statistics: A supplement to the summary of national transportation statistics  
[PB-269301/8] 16 p0559 N77-33672
- STATISTICAL DISTRIBUTIONS**  
Distribution of direct and total solar radiation availabilities for the USA 16 p0471 A77-48926
- GDIST: A computer code for analysis of statistical distributions of physical data  
[PB-266762/4] 16 p0533 N77-31589
- STATISTICAL WEATHER FORECASTING**  
Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data 13 p0039 A77-12824
- STEADY STATE**  
The dependence of current output of the Ti-Tl SnO<sub>2</sub>/Pt iron-thioline photogalvanic cell on photostationary state composition --- Totally illuminated, Thin Layer 16 p0502 A77-50220
- STEAM**  
Isotopic composition of steam samples from Lanzarote, Canary Islands 13 p0013 A77-11497
- Thermal optimization of steam generating systems for tower type solar steam power plants - Tasks and methods 14 p0152 A77-21830
- More about geothermal steam or the hottest energy prospect ever --- Book 14 p0191 A77-26925
- Design and field test of a steam powered downhole geothermal pump 16 p0456 A77-48806
- Solar industrial steam 16 p0482 A77-49029
- Solar industrial steam [UCRL-77895] 14 p0231 N77-20592
- Unit commitment in large power systems: Economic priorities of steam units and applications of pumped-storage generation 16 p0545 N77-32588
- STEAM FLOW**  
Making electricity from moderate temperature fluids --- geothermal sources 13 p0002 A77-10649
- Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes 14 p0177 A77-24571
- Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium 14 p0198 A77-28776
- STEAM TURBINES**  
Steam station repowering - A near-term method of energy conservation 13 p0022 A77-12679
- Comparison of geothermal power conversion cycles 13 p0030 A77-12750
- Thermionic topping of a steam power plant 13 p0034 A77-12789
- Combination power plants for improved utilization of fossil fuels 13 p0045 A77-12939
- Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator 14 p0136 A77-20109
- Combined gas/steam cycle power and heat generating plants 14 p0155 A77-22023
- One MW/th/ bench model cavity receiver steam generator --- solar energy conversion system component 14 p0158 A77-22642
- Optimal overall efficiency for a solar radiation collector utilizing a two fluid Rankine Cycle to generate electrical power 14 p0182 A77-26056
- A solar generator --- for cold-steam turbine operations 15 p0268 A77-32403
- Running out of steam. III --- alternatives to internal combustion engine 15 p0310 A77-36984
- Coal gasification power generation 15 p0310 A77-37000
- Dynamic modeling and control of magnetohydrodynamic/steam electrical power generating plants 15 p0332 A77-39572
- Investigating the starting modes of the GT-35 gas turbine plant --- turbocompressor tests 16 p0426 A77-45324
- Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California --- in geothermal resources exploitation 16 p0455 A77-48801
- Geothermal power cycle analysis 16 p0455 A77-48803
- Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831
- Comparative evaluation of technical and economic indices for MHD and thermionic toppers for steam turbine facilities 16 p0469 A77-48909
- Metallurgical evaluation of materials for geothermal power plant applications 16 p0499 A77-49700
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 1: Summary and combined gas-steam turbine plant with an integrated low-BTU gasifier [NASA-CR-134942-VOL-1] 15 p0379 N77-26628
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 2: Summary and combined gas-steam turbine plant using coal derived liquid fuel [NASA-CR-134942-VOL-2] 15 p0379 N77-26629
- STERIS**  
Thermal energy storage using large hollow steel ingots 16 p0492 A77-49106
- Ship steel weldments for low temperature service [PB-256997/8] 13 p0103 N77-12203
- Characterization and evaluation of wastewater sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976 [PB-255586/0] 13 p0116 N77-13566
- Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels [BLL-M-25473-(5828.4P)] 15 p0359 N77-24245
- Environmental considerations of selected energy conserving manufacturing process options. Volume 3: Iron and steel industry report [PB-264269/2] 15 p0384 N77-26680
- STELLAR EVOLUTION**  
Details of hydrogen-burning thermonuclear reactions 14 p0168 A77-23457
- STELLARATORS**  
Possibility of medium energy neutral beam injection into stellarator reactor 14 p0184 A77-26093
- State of the art of controlled fusion 14 p0194 A77-27722
- STILLS**  
Optimum design of a single slope solar still in Riyadh, Saudi Arabia 16 p0417 A77-42956
- STIRLING CYCLE**  
The Stirling engine - Engineering considerations in view of future needs 13 p0041 A77-12842
- Self-starting, intrinsically controlled Stirling engine 13 p0041 A77-12844
- Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up --- utilizing Stirling engine 13 p0051 A77-14580
- Gas-fired heat pumps - An emerging technology 14 p0195 A77-27891
- Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant --- utilizing Stirling engine 15 p0291 A77-34974
- Design considerations on a thermal energy storage Stirling engine automobile [SAB PAPER 770080] 16 p0424 A77-44558
- The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report [SAB PAPER 770081] 16 p0424 A77-44559

- Design of the 4-215 D.A. automotive Stirling engine  
[SAE PAPER 770082] 16 p0424 A77-44560
- Further Stirling engine development work. I  
16 p0442 A77-48496
- Procedure for calculating thermocompressor  
thermodynamical parameters --- for solar energy  
conversion 16 p0442 A77-48519
- Development of a Stirling engine powered heat  
activated heat pump 16 p0448 A77-48745
- Thermal oscillators --- free piston valveless  
closed cycle Stirling or Ericsson cycle thermal  
machines 16 p0465 A77-48879
- Demonstration of a Free-Piston Stirling Linear  
Alternator power conversion system 16 p0465 A77-48880
- Practicability study of Stirling total energy  
systems 16 p0465 A77-48882
- A new mathematical model for Stirling cycle machines  
16 p0465 A77-48884
- A new ported constant volume external heat supply  
regenerative cycle --- for Stirling cycle engines  
16 p0465 A77-48885
- A solar/Stirling total energy system 16 p0481 A77-49021
- Ceramic applications in the advanced Stirling  
automotive engine [NASA-TM-X-73632] 15 p0354 A77-23487
- STOCHASTIC PROCESSES**
- Solar powered absorption cycle simulation using  
real and stochastic weather data [ASME PAPER 76-WA/SOL-6] 14 p0188 A77-26511
- Critical comments concerning the application of  
the availability concept in power plant technology  
15 p0265 A77-31850
- Modeling algorithms and their implementation on a  
digital computer for calculating the capacity of  
storage cells at wind-power and solar energy  
installations 15 p0316 A77-37775
- Autocorrelation and stochastic modelling of  
insolation sequences --- for solar thermal systems  
16 p0422 A77-44479
- Simulation algorithms and their realization by  
digital computer for calculation of wind- and  
solar-plant storage-service capacity 16 p0437 A77-47431
- Stochastic modelling of site wind characteristics  
[PB-261178/8] 15 p0351 A77-22775
- STOCKPILING**
- Strategic petroleum reserve plan (Public Law  
94-163, section 154) [PB-261737/1] 15 p0342 A77-22591
- Strategic petroleum reserve draft environmental  
impact statement for Central Rock Mine  
[PB-262390/8] 15 p0362 A77-24572
- Strategic petroleum reserve. Draft environmental  
impact statement for Ironton Mine  
[PB-262451/8] 15 p0362 A77-24573
- Effects of alternative oil stockpiling programs on  
the US economy, 1976-1979 [BNL-50541] 15 p0369 A77-24999
- A screening for potentially critical materials for  
the National stockpile [PB-267214/5] 16 p0533 A77-31595
- STORAGE BATTERIES**
- Performance characteristics of solid  
lithium-aluminum alloy electrodes 13 p0007 A77-11107
- New electrochemical current sources 13 p0020 A77-12650
- Small electric vehicle considerations in view of  
performance and energy usage 13 p0024 A77-12698
- Ambient temperature electric vehicle batteries  
based on lithium and titanium disulfide  
13 p0025 A77-12706
- Electric vehicle performance with alternate  
batteries 13 p0025 A77-12707
- Advances in component technology for nickel-zinc  
cells 13 p0025 A77-12710
- Review of electrode designs and fabrication  
techniques for lithium-aluminum/iron sulfide cells  
13 p0025 A77-12713
- Development status of lithium-silicon-iron sulfide  
load-leveling batteries 13 p0026 A77-12714
- Development of sodium/sulfur-cells 13 p0026 A77-12716
- Sodium/sulphur battery development in the United  
Kingdom 13 p0026 A77-12717
- Small space station electrical power system design  
concepts 13 p0040 A77-12835
- Electric vehicle batteries - Opportunities for  
materials improvement 13 p0049 A77-13736
- Some studies on sodium/sulfur cells 13 p0055 A77-15813
- Electric current from the direct conversion of low  
molecular weight C,H,O-compounds 13 p0055 A77-15814
- Research on battery-operated electric road vehicles  
14 p0146 A77-21701
- A power plant of the Aerosolec type 14 p0153 A77-21839
- Traction batteries for existing and future  
electric road vehicles 14 p0159 A77-22878
- Basic requirements for the various items of  
equipment for supplying energy to electrically  
driven road vehicles from the point of view of  
the user 14 p0160 A77-22890
- Performance of an electric van fitted with a  
hydrodynamic torque converter transmission 14 p0160 A77-22897
- Development of a high performance and lightweight  
hybrid flywheel/battery powered electric vehicle  
drive 14 p0160 A77-22898
- Impacts of future use of electric  
cars in US cities 14 p0161 A77-22902
- Sodium/sulphur battery design and development for  
motive power applications 14 p0161 A77-22905
- Near-term advanced electric vehicle batteries  
14 p0161 A77-22909
- The lithium-water-air battery for automotive  
propulsion 14 p0162 A77-22915
- Electrochemical battery trends for aircraft and  
missile applications [AIAA PAPER 77-481] 14 p0172 A77-23901
- Space battery technology for the 1980s  
[AIAA PAPER 77-482] 14 p0172 A77-23902
- Lithium-aluminum/metal sulfide batteries  
[AIAA PAPER 77-483] 14 p0172 A77-23903
- Performance analysis of a solar-electrical system  
with a load and storage batteries 14 p0177 A77-24570
- Basic research problems in the generation of  
electrochemical energy for powering small  
private vehicles 14 p0180 A77-25721
- Power Sources Symposium, 27th, Atlantic City,  
N.J., June 21-24, 1976, Proceedings 14 p0195 A77-28126
- Photoelectrochemical energy conversion and storage  
- The polycrystalline CdSe cell with different  
storage modes 14 p0196 A77-28463
- Experience in using bimodal distribution curves to  
evaluate the reliability of systems supplying  
energy from renewable sources --- solar and wind  
systems for radio relay links 14 p0201 A77-29535
- Heat transfer analysis of metal hydrides in  
metal-hydrogen secondary batteries 15 p0278 A77-33363
- Storage batteries - The case and the candidates  
[AIAA 77-1007] 16 p0403 A77-41554
- The interaction of batteries and fuel cells with  
electrical distribution systems - Line  
commutated converter interface 16 p0414 A77-42634
- The interaction of batteries and fuel cells with  
electrical distribution systems - Force  
commutated converter interface 16 p0414 A77-42635
- Rechargeable batteries in Japan --- Book  
16 p0431 A77-46783



## SUBJECT INDEX

## STRUCTURAL DESIGN

- The zinc-bromine battery - Possible candidate for electric vehicles and load leveling 16 p0446 A77-48725
- The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery 16 p0446 A77-48726
- Design of a current technology electric vehicle 16 p0446 A77-48727
- Flywheel module for electric vehicle regenerative braking 16 p0447 A77-48728
- Rechargeability studies of ambient temperature lithium/sulfur batteries 16 p0447 A77-48729
- The storability of Li/SO<sub>2</sub> cells 16 p0447 A77-48730
- Recent progress in development of sodium-sulfur battery for utility application 16 p0448 A77-48740
- Electrically rechargeable REDOX flow cell [NASA-CASE-LFW-12220-1] 13 p0121 N77-14581
- Comparing the electric lead-acid battery vehicle with a hydrogen fueled vehicle incorporating an Fe-Ti hydride storage unit [BNL-20990] 14 p0211 N77-17577
- Applications and prospect of energy storage batteries [CONF-760416-2] 14 p0230 N77-20578
- Evaluation of a 1 kWh zinc chloride battery system [PB-260683/8] 14 p0236 N77-21356
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 14 p0239 N77-21597
- Engineering design and cost analysis of chlorine storage concepts for a zinc-chlorine load-leveling battery [PB-262016/9] 14 p0252 N77-21727
- Development program for solid electrolyte batteries [PB-260719/0] 15 p0341 N77-22398
- High-performance batteries for off-peak energy storage and electric-vehicle propulsion [ANL-76-81] 15 p0345 N77-22631
- Development of sodium-sulfur batteries for utility application [EPRI-EN-266] 15 p0391 N77-27510
- Hydrogen-halogen energy storage system: Preliminary feasibility and economic assessment [BNL-22164] 16 p0537 N77-31635
- Redox bulk energy storage system study, volume 1 [NASA-CR-135206-VOL-1] 16 p0553 N77-33608
- Redox bulk energy storage system study, volume 2 [NASA-CR-135206-VOL-2] 16 p0553 N77-33609
- STORAGE RINGS (PARTICLE ACCELERATORS)**
- Systems analysis of accelerator and storage ring systems for inertial fusion 15 p0334 A77-39744
- STORAGE TANKS**
- Design and performance of thermal storage water tank 13 p0075 A77-19079
- Energy storage in the form of latent heat 14 p0157 A77-22350
- Storage tanks - A numerical experiment --- for solar heating 14 p0180 A77-25898
- Energy storage --- review 15 p0264 A77-31579
- A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 15 p0279 A77-33378
- Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552
- Thermal storage - It saves and saves and saves --- energy conservation 16 p0415 A77-42741
- Minimum cost sizing of solar heating systems 16 p0480 A77-49010
- Inorganic phase change materials for energy storage in solar thermal program 16 p0492 A77-49103
- An immiscible fluid - Heat of fusion energy storage system 16 p0493 A77-49113
- Temperature distribution of a hot water storage tank in a simulated solar heating and cooling system [NASA-TN-X-73549] 13 p0106 N77-12521
- A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 14 p0240 N77-21612
- Physical metallurgy of FeTi-hydride and its behavior in a hydrogen storage container 14 p0242 N77-21620
- Strategic petroleum reserve. Final environmental impact statement, volume 2 [PB-261800/7] 15 p0349 N77-22676
- Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks [PB-262789/1] 15 p0371 N77-25551
- STRATIFICATION**
- Stratified density solar collection ponds - Physical factors, results of previous investigations, and suggested experiments 16 p0418 A77-42964
- STRATOSPHERE**
- Stratospheric heating due to absorption of solar radiation by NO<sub>2</sub> 13 p0013 A77-11568
- STRESS ANALYSIS**
- Optimization of composite flywheel design 15 p0260 A77-31044
- Calculation of thermal stresses in ceramic elements of the refractory channel walls of a magnetohydrodynamic generator 15 p0263 A77-31540
- A 100-kW metal wind turbine blade basic data, loads and stress analysis [NASA-CR-134956] 14 p0236 N77-21467
- STRESS CONCENTRATION**
- Energy storage - An interference assembled multiring superflywheel 16 p0450 A77-48761
- STRESS CORROSION CRACKING**
- Hydrogen sulfide stress corrosion cracking in materials for geothermal power [COO-2576-3] 16 p0519 N77-29269
- STRESS RELAXATION**
- Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750
- STRIP MINING**
- Water requirements for an integrated SNG plant and mine operation 13 p0060 A77-16651
- Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act [E77-10007] 13 p0085 N77-10590
- Development of a multi-disciplinary ERTS user program in the state of Ohio [E77-10045] 13 p0104 N77-12475
- An application of ERTS technology to the evaluation of coal strip mining and reclamation in the northern Great Plains [NASA-CR-149208] 13 p0104 N77-12486
- Interpretation of Pennsylvania agricultural land use from ERTS-1 data [E77-10111] 14 p0215 N77-18525
- Design modification of Pemco Model 702909 wireless ground monitor --- for use in strip mining [PB-262858/4] 15 p0360 N77-24371
- STRUCTURAL ANALYSIS**
- Heat pipes for fluid-bed gasification of coal - Metallurgical condition of heat pipes after tests in process environment 13 p0031 A77-12764
- Sandia vertical-axis wind turbine program [SAND-76-0338] 14 p0250 N77-21686
- STRUCTURAL DESIGN**
- Dual optimum aerodynamic design for a conventional windmill 13 p0048 A77-13704
- Captation and concentration of solar energy 13 p0074 A77-19063
- Performance of two fixed-mirror solar concentrators for process heat 13 p0074 A77-19065
- Design and performance of thermal storage water tank 13 p0075 A77-19079
- Engineering development status of the Darrieus wind turbine 14 p0166 A77-23365

# STRUCTURAL DESIGN CRITERIA

# SUBJECT INDEX

The importation of liquefied natural gas  
 14 p0194 A77-27607  
 Answer House story --- utilizing solar cooling and  
 solar heating 15 p0333 A77-39664  
 Compact shrouds for wind turbines 16 p0416 A77-42891  
 Solar collectors --- for heating and cooling of  
 buildings 16 p0471 A77-48935  
 A solar home for low income families 16 p0476 A77-48970  
 The solar fan - Solar induced draft air  
 conditioning system 16 p0478 A77-48988  
 A passive solar heated house - Design and  
 construction 16 p0478 A77-48989  
 Reinforced pillow solar water heater 16 p0493 A77-49114  
 Solar high technology and architecture 16 p0495 A77-49129  
 Description of Provident House, King City, Ontario  
 16 p0495 A77-49133  
 Self sufficient energy integrated design and  
 construction method for low cost-self help  
 housing programs 16 p0495 A77-49137  
 Perceptual assessment of a new energy concept  
 16 p0496 A77-49138  
 Composites for large space structures  
 [IAF PAPER 77-65] 16 p0507 A77-51416  
 Battery-flywheel hybrid electric power system for  
 near term application. Volume 2: System design  
 [UCID-17098-VOL-2] 14 p0228 A77-20443  
 Design and modeling of solar sea power plants by  
 geometric programming  
 [COO-2895-11] 14 p0231 A77-20585  
 Sandia vertical-axis wind turbine program  
 [SAND-76-0338] 14 p0250 A77-21686  
 Design problems associated with the use of  
 evacuated glass receivers for solar collectors  
 [CONF-7606128-1] 15 p0393 A77-27536  
 Lightweight reflector assembly  
 [NASA-CASE-NPO-13707-1] 16 p0518 A77-28933  
 Current fusion power plant design concepts  
 [BNWL-2013] 16 p0549 A77-32894

**STRUCTURAL DESIGN CRITERIA**  
 Energy savings obtained by applying the findings  
 of construction physics. II 16 p0441 A77-48259  
 Geothermal R and D project report, 1 January - 31  
 March 1976 14 p0222 A77-19607  
 [ANCR-1319]  
 Modular 5 MW geothermal power plant design  
 considerations and guidelines 14 p0222 A77-19612  
 [UCRL-13684]  
 Advanced technology fuel cell program  
 [EPRI-EM-335] 15 p0391 A77-27508  
 Conceptual design study for a laser fusion hybrid  
 [UCRL-78682] 15 p0397 A77-27926  
 Engineering study of the module/array interface  
 for large terrestrial photovoltaic arrays  
 [ERDA/JPL-954698-77/1] 16 p0528 A77-30609

**STRUCTURAL ENGINEERING**  
 Dimensioning of the solar heating system in the  
 Zero Energy House in Denmark 15 p0256 A77-30319  
 Energy savings by application of knowledge of  
 building physics. I - Wall permeability and its  
 significance for the atmospheric conditions in  
 the building interior, the design and the  
 thermal characteristics of windows, problems  
 concerning the permeability of the joints  
 15 p0261 A77-31373

**STRUCTURAL RELIABILITY**  
 Development of a small radioisotopic heat source  
 13 p0042 A77-12852

**STRUCTURAL STRAIN**  
 Selection of structural materials for hydrogen  
 pipelines and storage vessels 14 p0243 A77-21625

**STRUCTURAL WEIGHT**  
 Estimating procedures associated with aircraft  
 modifications 13 p0016 A77-12181  
 [SAWE PAPER 1101]  
 Ultralightweight solar array for Naval Sea Control  
 Systems 13 p0040 A77-12828

Nuclear-powered Hysat spacecraft: Comparative  
 design study [ERDA-SNS-3063-8] 13 p0094 A77-11108  
 Attic concentrator type solar energy collector  
 [BNL-50493] 13 p0098 A77-11539  
 Innovative Aircraft Design Study (IADS) task 2,  
 volume 1 [AD-A041234] 16 p0531 A77-31141

**SUBMILLIMETER WAVES**  
 Electron concentration measurements in combustion  
 MHD flows by submillimeter laser interferometry  
 16 p0425 A77-44821

**SUBROUTINES**  
 OPTINO - A method for process evaluation applied  
 to the thermochemical decomposition of water  
 15 p0320 A77-38526

**SUBSIDENCE**  
 Potential land subsidence at geothermal  
 development sites 15 p0286 A77-33525  
 Comprehensive ground control study of a mechanized  
 longwall operation. Volume 2: Special reports.  
 1: Physical properties of coal and coal measure  
 rocks. 2: Bearing capacity of roof and floor  
 rocks. 3: Response of borehole pressure cells.  
 4: Installation of subsurface instrumentation  
 [PB-262476/5] 15 p0368 A77-24711  
 The analysis of subsidence associated with  
 geothermal development. Volume 1: Handbook  
 [PB-263692/6] 15 p0369 A77-24714  
 The analysis of subsidence associated with  
 geothermal development. Volume 2: Research  
 report [PB-263693/4] 15 p0369 A77-24715  
 The analysis of subsidence associated with  
 geothermal development. Volume 3: Information  
 bank [PB-263694/2] 15 p0369 A77-24716

**SUBSONIC AIRCRAFT**  
 The next-generation subsonic transport  
 [SAWE PAPER 1127] 13 p0016 A77-12195  
 Energy and economic trade offs for advanced  
 technology subsonic aircraft 14 p0201 A77-29471  
 Hydrogen-fueled subsonic aircraft: A perspective  
 13 p0084 A77-10344

**SUBSONIC FLOW**  
 Effect of nonuniform conductivity in the boundary  
 layer at the electrode wall on local  
 characteristics of an MHD generator with a  
 diagonal electrode configuration and a subsonic  
 stream 13 p0001 A77-10423  
 Acoustic properties of subsonic MHD channel  
 13 p0054 A77-15668  
 Subsonic MHD-diffuser performance with high blockage  
 15 p0331 A77-39567  
 The intermittent jet for supersonic conditions  
 increased with passage to operating in a ramjet  
 - A low cost engine 15 p0339 A77-22130

**SUBSTITUTES**  
 Economy-wide impacts of interfuel substitution:  
 Substitution of electricity for imported oil  
 [BNL-50538] 15 p0369 A77-24998

**SUBSTRATES**  
 Thermally induced migration of hydrocarbon oil  
 15 p0268 A77-32375  
 A performance evaluation of various coatings,  
 substrate materials, and solar collector systems  
 [NASA-TM-X-73355] 13 p0128 A77-15489  
 The 275 deg C microcircuitry: Resistors,  
 capacitors, conductors, substrates, and bonding  
 [SAND-76-0611] 15 p0389 A77-27312

**SUBURBAN AREAS**  
 Impact of a suburban rapid transit line of fuel  
 consumption and cost for the journey-to-work.  
 Analysis of the Philadelphia-Lindenwood  
 high-speed line [PB-263048/1] 15 p0370 A77-25014

**SUGAR BEETS**  
 Systems study of fuels from sugar cane, sweet  
 sorghum, and sugar beets [TID-27032] 14 p0211 A77-17570  
 Systems study of fuels from sugarcane, sweet  
 sorghum, sugar beets, and corn [TID-27336] 15 p0377 A77-26324

# SUBJECT INDEX

# SULFUR OXIDES

## SUGAR CANE

- Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations --- Book 16 p0428 A77-46250
- Systems study of fuels from sugar cane, sweet sorghum, and sugar beets [TID-27032] 14 p0211 A77-17570
- Systems study of fuels from sugarcane, sweet sorghum, sugar beets, and corn [TID-27336] 15 p0377 A77-26324

## SUGARS

- Enzymatic hydrolysis of cellulosic wastes to fermentable sugars for alcohol production 15 p0315 A77-37666

## SULFATES

- Aerosol formation during coal combustion - Condensation of sulfates and chlorides on flyash 13 p0054 A77-15778
- General Motors Sulfate Dispersion Experiment - Assessment of the EPA HIWAY model 13 p0071 A77-18882
- Automotive sulfate emissions 15 p0290 A77-34629

## SULFIDES

- Development of compact lithium/iron disulfide electrochemical cells 13 p0026 A77-12715
- Lithium-aluminum/metal sulfide batteries [AIAA PAPER 77-483] 14 p0172 A77-23903
- Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems 15 p0337 A77-40028
- The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery 16 p0446 A77-48726

## SULFONIC ACID

- New materials for fluorosulfonic acid electrolyte fuel cells [AD-A036588] 15 p0380 A77-26640

## SULFUR

- Development of sodium/sulfur-cells 13 p0026 A77-12716
  - Sodium/sulphur battery development in the United Kingdom 13 p0026 A77-12717
  - Some studies on sodium/sulfur cells 13 p0055 A77-15813
  - Assessing low sulfur coal resources in Montana and Wyoming 13 p0058 A77-16374
  - Batch autoclave studies of catalytic hydrodesulfurization of coal 14 p0145 A77-21617
  - Sodium/sulphur battery design and development for motive power applications 14 p0161 A77-22905
  - Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353
  - Some UK progress in sodium sulphur technology --- battery for electric motor vehicles [SAE PAPER 770280] 16 p0424 A77-44563
  - A new design for the high-performance sodium-sulfur battery [SAE PAPER 770281] 16 p0424 A77-44564
  - Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite 16 p0508 A77-51587
  - Heat pipes for the temperature range from 200 to 600 C --- noting sulfur with iodine additive as working fluid 13 p0119 A77-14381
  - Availability of potential coal supply through 1985 by quality characteristics [PB-256680/0] 13 p0121 A77-14573
  - Some studies on a solid state sulfur probe for coal gasification systems [NASA-TN-78428] 16 p0534 A77-31605
- ## SULFUR COMPOUNDS
- Sulfur compounds in oils from the Western Canada Tar Belt 14 p0169 A77-23553
  - The Westinghouse Sulfur Cycle for the thermochemical decomposition of water 15 p0277 A77-33354

- Development progress on the Sulfur Cycle Water Decomposition System --- for hydrogen production 16 p0457 A77-48813
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families 14 p0238 A77-21572

- The Westinghouse sulfur cycle for the thermochemical decomposition of water 14 p0238 A77-21587
- Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle 14 p0238 A77-21589

## SULFUR DIOXIDES

- Sulphur pollution and emission charges 13 p0005 A77-11033
  - Is nuclear energy economically viable --- competition with coal 13 p0045 A77-12933
  - SO2 control technologies - Commercial availabilities and economics 14 p0191 A77-27279
  - State of the art of particulate and SO2 removal on coal fired boilers 15 p0293 A77-35167
  - Synthetic additives for SO2 removal from combustion gas in a fluidized-bed coal combustor 15 p0293 A77-35168
  - A method for evaluating SO2 abatement strategies 15 p0293 A77-35169
  - Determination of SO2 concentrations from a coal-burning power plant stack by Fourier spectrometry 15 p0296 A77-36024
  - Economic and energy considerations in MHD seed regeneration --- for sulfur oxides removal in coal-fired power plants 15 p0332 A77-39574
  - Further studies on the oxidation of sulfur dioxide in coal-fired power plant plumes 15 p0333 A77-39657
  - Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407
  - Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants 16 p0420 A77-44178
  - Catalytic action of combustion-product deposits in the oxidation of SO2 to SO3 within the combustion chambers and exhaust channels of thermoelectric plants 16 p0420 A77-44179
  - Status of sulfur dioxide removal systems for the electric utility industry 16 p0504 A77-51144
  - The air quality and economic implications of supplementary control systems in Illinois --- considering electric power plant fuels [PB-255699/1] 13 p0101 A77-11588
  - Standards support and environmental impact statement. Volume 1: Proposed standards of performance for petroleum refinery sulfur recovery plants [PB-257975/3] 14 p0213 A77-17647
- ## SULFUR OXIDES
- Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541
  - Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products 15 p0269 A77-32506
  - Formation of sulfuric anhydride and nitrogen oxides in boilers at variable operating modes 15 p0272 A77-33174
  - Chemical reduction of SO3, particulates and NOx emissions 15 p0294 A77-35188
  - Operation results of the desulfurization plant for a thermal power station 15 p0299 A77-36279
  - A 1977 approach to sulfur oxide emissions [ASME PAPER 77-JPGC-PWR-1] 16 p0508 A77-51621
  - Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB-255317/0] 13 p0110 A77-12597

Hot fuel gas desulfurization  
[PB-257036/4] 13 p0133 N77-15539

Control of oxides of sulfur from stationary  
sources in the south coast air basin of California  
[PB-261754/6] 15 p0348 N77-22668

Oxidation of sulfur dioxide in power plant plumes  
[BNL-21658] 15 p0386 N77-26713

Report of the Hearing Panel: National Public  
hearing on Power Plant Compliance with Sulfur  
Oxide Air Pollution Regulations  
[PB-264891/3] 15 p0396 N77-27625

**SULFURIC ACID**

Entropy production, efficiency, and economy in the  
case of the thermochemical production of  
synthetic fuels - The sulfuric acid-hybrid  
process for thermochemical water decomposition  
14 p0145 A77-21544

Electrochemical neutralization of acid mine water  
16 p0420 A77-43651

Irreversibilities, heat penalties, and economics  
for the methanol/sulfuric acid process --- for  
hydrogen production 16 p0457 A77-48814

Thermal energy storage by the sulfuric acid-water  
system 16 p0492 A77-49108

**SUMMER**

Summer performance results obtained from  
simultaneously testing ten solar collectors  
outdoors  
[NASA-TM-X-73594] 14 p0229 N77-20563

**SUNLIGHT**

Theoretical maximum for energy from direct and  
diffuse sunlight 13 p0064 A77-17845

Lighting with sunlight using sun tracking  
concentrators 15 p0260 A77-31245

Solar assisted heat pumps: A possible wave of the  
future  
[NASA-CR-2771] 13 p0121 N77-14584

Photovoltaic energy conversion using concentrated  
sunlight  
[SAND-76-5759] 14 p0225 N77-19647

Preliminary report on simulation of a heliostat  
field  
[EBDA-TR-158] 14 p0226 N77-19782

Silicon solar cell development for  
concentrated-sunlight, high-temperature  
applications  
[SAND-76-5311] 15 p0380 N77-26647

Results from circumsolar radiation measurements  
[LBL-5292] 15 p0382 N77-26657

Silicon solar cell testing in concentrated  
sunlight and simulated sunlight 16 p0527 N77-30540

**SUPERCHARGERS**

Performance and NOx emissions modeling of a jet  
ignition prechamber stratified charge engine  
[SAE PAPER 760161] 13 p0016 A77-12150

Effects of a thermal reactor on the energy  
efficiency of a turbocharged, stratified charge  
engine  
[AD-A026059] 13 p0128 N77-15409

**SUPERCONDUCTING MAGNETS**

Experiment on MHD generator with a large-scale  
superconducting magnet /ETL Mark V/  
13 p0049 A77-13728

Pulsed energy conversion with a dc superconducting  
magnet 13 p0081 A77-19293

The technology base for large MHD superconducting  
magnets 14 p0140 A77-21233

All-round technical and economic investigations of  
open-cycle industrial MHD generator channels and  
superconducting magnet systems 14 p0142 A77-21266

Air Force applications of lightweight  
superconducting machinery 14 p0144 A77-21360

Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361

Superconducting induction coil for a doublet  
Tokamak experimental fusion power reactor  
14 p0144 A77-21376

Superconducting magnets for an MHD test facility  
and base load power plant 14 p0144 A77-21379

Ultra high-current superconducting cables for a  
2.2-tesla, 300-kilojoule energy storage magnet  
14 p0144 A77-21391

Armature of the MIT-EPRI superconducting generator  
14 p0157 A77-22575

PULSAR - A flux compression stage for coal-fired  
power plants 14 p0190 A77-26544

Progress in switching technology for HETS systems  
--- Magnetic Energy Transfer and Storage  
15 p0303 A77-36377

Experiment on MHD generator with a large scale  
superconducting magnet /ETL Mark V/  
15 p0325 A77-39527

Superconducting magnet development for the MHD  
program 15 p0331 A77-39569

Cryogenic design for large superconductive energy  
storage magnets 16 p0411 A77-42156

Temperature excursions during loss of magnet  
coolant accidents with thermalization of energy  
of large superconducting solenoids 16 p0411 A77-42160

Applications of superconducting magnets to energy  
with particular emphasis on fusion power  
16 p0411 A77-42161

Large-scale applications of superconductivity  
16 p0412 A77-42475

Design study of superconducting magnets for a  
combustion magnetohydrodynamic (MHD) generator  
[NASA-CR-135178] 14 p0234 A77-20886

Ultra high-current superconducting cables for a  
2.2-Tesla, 300-kilojoule energy storage magnet  
[LA-UR-76-1809] 14 p0235 N77-21325

Superconducting energy storage development for  
electric utility systems  
[LA-UR-76-2294] 15 p0381 N77-26649

Superconducting magnetic energy storage  
[LA-UR-76-2047] 15 p0397 N77-27933

**SUPERCONDUCTING POWER TRANSMISSION**

High speed superconducting generator  
14 p0144 A77-21383

Thermal performance of the rotor of the MIT-EPRI 3  
MVA superconducting alternator --- cryogenic  
cooling 14 p0144 A77-21384

Superconducting a.c. generators - Progress on the  
design of a 1300 MW, 3000 rev/min generator  
14 p0144 A77-21386

Ultra high-current superconducting cables for a  
2.2-tesla, 300-kilojoule energy storage magnet  
14 p0144 A77-21391

Element rating and coupling harmonics in a  
superconductive energy transfer system  
16 p0411 A77-42164

Large-scale applications of superconductivity  
16 p0412 A77-42475

Experimental study of several modes of operation  
of a laboratory section of a three-phase  
superconducting power transmission cable  
16 p0438 A77-47753

Non-nuclear energy technology. Low temperature  
cable for power transmission  
[BNFT-PB-T-76-01] 14 p0210 N77-17372

Assessment and study of existing concepts and  
methods of cryogenic refrigeration for  
superconducting transmission cables  
[COO-2552-6] 14 p0214 N77-18352

Ultra high-current superconducting cables for a  
2.2-Tesla, 300-kilojoule energy storage magnet  
[LA-UR-76-1809] 14 p0235 N77-21325

Brookhaven superconducting cable test facility  
[BNL-21780] 14 p0236 N77-21331

Studies of helical conductor models for  
superconducting ac power transmission  
[BNL-21784] 14 p0236 N77-21332

Cryogenic power transmission technology:  
Cryogenic dielectrics  
[ORNL-TM-5498] 15 p0341 N77-22297

Resistance of superconducting-normal  
metal-superconducting sandwiches  
[LBL-5473] 15 p0341 N77-22393

The turbo-generator with superconducting field  
winding in transient operation  
[BLL-BIS-10351] 15 p0360 N77-24381

- Comparative cost study of the processes for producing niobium-tin (Nb<sub>3</sub>Sn) superconducting tapes for their application to power transmission lines  
[ERDA-76-160] 15 p0387 N77-26999
- Cryogenic power transmission technology:  
Cryogenic dielectrics  
[ORNL-TN-5608] 15 p0389 N77-27249
- Design of multifilamentary Nb<sub>3</sub>Sn superconductor tailored to the requirements of a dc superconducting power transmission line  
[LA-UR-77-99] 15 p0389 N77-27311
- Helium research in support of superconducting power transmission  
[PB-265(76/0)] 15 p0390 N77-27326
- Applications of superconductivity in electric power systems  
[LA-UR-76-1998] 15 p0398 N77-27996
- Power transmission project  
[BNL-22202] 16 p0551 N77-33426
- SUPERCONDUCTIVITY**  
Superconductivity, energy storage and switching  
15 p0299 A77-36309
- Applications of superconductivity in electric power systems  
[LA-UR-76-1998] 15 p0398 N77-27996
- SUPERCONDUCTORS**  
Research and development of cryoalternators for large-electrical power systems 14 p0190 A77-26536
- Critical materials problems in energy production --- Book 16 p0509 A77-51627
- High power study, superconducting generators  
[AD-A031620] 15 p0342 N77-22408
- Design of multifilamentary Nb<sub>3</sub>Sn superconductor tailored to the requirements of a dc superconducting power transmission line  
[LA-UR-77-99] 15 p0389 N77-27311
- SUPERCRITICAL PRESSURES**  
Helium research in support of superconducting power transmission  
[PB-265(76/0)] 15 p0390 N77-27326
- SUPERFLUIDITY**  
Cryogenic design for large superconductive energy storage magnets 16 p0411 A77-42156
- SUPERSONIC COMBUSTION**  
Slag flow and current transport in a simulated generator environment 15 p0330 A77-39562
- Direct-connect tests of hydrogen-fueled supersonic combustors 16 p0440 A77-48240
- SUPERSONIC FLOW**  
Non equilibrium ionization in a linear magnetohydrodynamic generator, using a high pressure supersonic argon flow 15 p0309 A77-36817
- SUPERSONIC NOZZLES**  
Experimental study of accelerating MHD-generator jets with supersonic flow distortion 15 p0269 A77-32519
- SUPERSONIC TRANSPORTS**  
Advanced supersonic transport propulsion requirements  
[AIAA PAPER 77-831] 16 p0410 A77-41969
- SUPPLYING**  
The supply of coal in the long run: The case of eastern deep coal  
[PB-252642/4] 13 p0086 N77-10626
- Electric energy supply alternatives for New York. Phase 2: An appraisal of electrical energy alternatives available to the State of New York  
[PB-249881/4] 13 p0101 N77-11575
- Supply and demand of fuel sources for automobiles  
[UCRL-78066] 14 p0219 N77-19275
- SUPPORT SYSTEMS**  
Orbital construction support equipment  
[NASA-CR-151460] 15 p0388 N77-27157
- SURFACE COOLING**  
Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324
- SURFACE DIFFUSION**  
Response of a partially illuminated solar cell 14 p0139 A77-21025
- SURFACE FINISHING**  
Thermal energy management techniques in spacecraft design and their potential for terrestrial applications 16 p0439 A77-47969
- SURFACE GEOMETRY**  
On black solar cells or the tetrahedral texturing of a silicon surface 13 p0004 A77-11000
- A novel cover slide for solar cells 14 p0148 A77-21789
- SURFACE LAYERS**  
Effectiveness of heat-emitting coatings with variable degree of blackness 13 p0111 N77-12893
- Solar absorption characteristics of several coatings and surface finishes --- for solar energy collectors  
[NASA-TN-X-3509] 14 p0229 N77-20567
- SURFACE PROPERTIES**  
Effect of optical properties of a surface exposed to solar radiation on the radiation balance 13 p0052 A77-14928
- Study of emittance distribution along the walls of a cellular low-loss cell in the case of a base surface with arbitrary emission indicatrix 13 p0069 A77-18495
- Study and materialization of a selective surface designed for direct thermal conversion of solar energy - Application to medium temperature range 13 p0069 A77-18496
- Contribution to the study of solar energy collectors - Selective plates and cells 13 p0072 A77-19051
- Progress in development and application of selective surfaces --- for solar collectors 13 p0072 A77-19052
- Antiloss cell structures - Coupling with a selective surface --- solar collector surface properties 14 p0148 A77-21790
- Antiloss cellular structures - The effect of the material cutoff wavelength --- of solar collectors 14 p0148 A77-21791
- Ellipsometry in the study of selective radiation-absorbing surfaces --- for solar energy 16 p0406 A77-41581
- The effect of dropwise condensation on glass solar properties 16 p0422 A77-44485
- The Alcoa 655 selective surface for aluminum --- for solar collectors 16 p0487 A77-49063
- Surface research for development of new electrocatalysts for acid electrolyte fuel cells  
[AD-A026053] 13 p0131 N77-15517
- SURFACE TEMPERATURE**  
Circumferential variations of bore heat flux and outside surface temperature for a solar collector tube 16 p0429 A77-46426
- Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire  
[AD-A031803] 14 p0228 N77-20393
- SURFACE VEHICLES**  
Performance of a hydrogen-powered transit vehicle 13 p0033 A77-12781
- Transport of the future and the tasks of science 13 p0048 A77-13643
- Basic requirements for the various items of equipment for supplying energy to electrically driven road vehicles from the point of view of the user 14 p0160 A77-22890
- The DDO bus, a suburban bus with electric drive, supplied either from overhead wire or from battery 14 p0161 A77-22913
- Development of low-power gas turbines with regenerative heat exchangers at MTU. I 15 p0289 A77-34122
- Electric vehicle research, development, and technology, foreign  
[AD-A040526] 16 p0542 N77-32034
- SURVEYS**  
Analysis of a Delphi study on hydrogen --- questionnaire survey on future energy utilization 15 p0284 A77-33411

# SUSPENSION SYSTEMS (VEHICLES)

# SUBJECT INDEX

User's guide to petroleum industry survey data type  
[PB-256635/4] 13 p0098 N77-11544

Site energy handbook. Volume 1: Methodology for  
energy survey and appraisal 15 p0355 N77-23607  
[ERCA-76-131/1]

Solar radiation atmospheric transmission research,  
phase 1 16 p0518 N77-28689  
[PB-266010/8]

**SUSPENSION SYSTEMS (VEHICLES)**

Amtrak's newest turboliners 14 p0138 A77-20699

**SUSQUEHANNA RIVER BASIN (MD-NY-PA)**

Interpretation of Pennsylvania agricultural land  
use from ERTS-1 data 14 p0215 N77-18525  
[E77-10111]

**SWIRLING**

Molecular gas performance of a disk generator with  
swirl 15 p0326 A77-39534

**SWITCHING**

Superconductivity, energy storage and switching 15 p0299 A77-36309

**SWITCHING CIRCUITS**

Optimization of the geometry of switching buses  
for thermoelements in thermoelectric generators 13 p0052 A77-14951

Energy storage, compression, and switching --- Book 15 p0299 A77-36284

The interaction of batteries and fuel cells with  
electrical distribution systems - Line  
commutated converter interface 16 p0414 A77-42634

The interaction of batteries and fuel cells with  
electrical distribution systems - Force  
commutated converter interface 16 p0414 A77-42635

Pulsed energy and switching requirements for  
Tokamak ohmic heating 15 p0357 N77-27932  
[LA-UR-76-2473]

**SWITZERLAND**

Solar energy in Switzerland 13 p0080 A77-19127

**SYNCHRONISM**

Synchronization of the ERDA-NASA 100 kW wind  
turbine generator with large utility networks 15 p0267 A77-32243

**SYNCHRONOUS MOTORS**

Thermal performance of the rotor of the MIT-EPRI 3  
MVA superconducting alternator --- cryogenic  
cooling 14 p0144 A77-21384

Synchronization of the ERDA-NASA 100 LkW wind  
turbine generator with large utility networks  
[NASA-TN-X-73613] 14 p0220 N77-19580

**SYNCHRONOUS SATELLITES**

NASA electric propulsion program  
[AIAA PAPER 76-1068] 13 p0045 A77-13033

Gravitationally stabilized satellite solar power  
station in orbit 14 p0196 A77-28421

Solar power satellite transportation 14 p0205 A77-30016

Space solar power versus space communications  
[IAF PAPER A-77-65] 16 p0507 A77-51532

Solar power satellite: Analysis of alternatives  
for transporting material to geosynchronous orbit  
[NASA-TN-X-74680] 14 p0235 N77-21136

**SYNOPTIC MEASUREMENT**

Power resource estimate of ocean surface waves 13 p0071 A77-18790

**SYNOPTIC METEOROLOGY**

Effects of anthropogenic emissions on climate - A  
review of selected topics 13 p0067 A77-18295

**SYNTHANE**

Solar SNG - Large-scale production of SNG by  
anaerobic digestion of specially grown plant  
matter --- Synthetic Natural Gas 13 p0021 A77-12671

Catalytic coal gasification for SNG production ---  
Synthetic Natural Gas 13 p0022 A77-12683

Production of methane using offshore wind energy 13 p0026 A77-12722

Water requirements for an integrated SNG plant and  
mine operation 13 p0060 A77-16651

Hydrogasification of oil shale 14 p0169 A77-23556

Political and economic justification for immediate  
realization of a syn fuels industry 14 p0191 A77-27276

Dilute-phase hydrogasification process for SNG  
production 14 p0191 A77-27277

The SYNTHANE process - Current status --- coal  
gasification 14 p0192 A77-27286

HYGAS process update --- hydrogen gasification of  
coal 14 p0192 A77-27296

Reactivity heat-treated coals in hydrogen --- for  
synthetic methane production 14 p0198 A77-28777

Synthesis of substitute natural gas on the basis  
of coal 15 p0268 A77-32249

Economic feasibility of the conversion of organic  
waste to fuel oil and pipeline gas 15 p0302 A77-36346

SNG from refuse and sewage sludge by the BIOGAS  
process 15 p0314 A77-37659

Synthetic natural gas from animal wastes by  
anaerobic fermentation 15 p0314 A77-37660

What's holding up coal gasification 16 p0423 A77-44522

BI-gas pilot plant processes 5 tph --- bituminous  
coal gasification 16 p0441 A77-48478

Hot and dry char let down system for the Synthane  
demonstration plant, phase 1 13 p0130 N77-15505  
[PERC-0058-4]

Water requirements for steam-electric power  
generation and synthetic fuel plants in the  
western United States 16 p0540 N77-31667  
[PB-268067/7]

**SYNTHETIC FUELS**

The hydrogen economy --- production and applications 13 p0006 A77-11041

Problems involved in improving the industrial fuel  
and energy balance 13 p0012 A77-11347

Synthetic fuels - Prices, prospects, and prior art 13 p0017 A77-12236

The long-range prospects for solar-derived fuels 13 p0017 A77-12240

Solar SNG - Large-scale production of SNG by  
anaerobic digestion of specially grown plant  
matter --- Synthetic Natural Gas 13 p0021 A77-12671

Hydrogen production by the steam-iron process 13 p0023 A77-12688

A preliminary engineering assessment of jet fuel  
production from domestic coal and shale derived  
oils 13 p0023 A77-12690

The commercial production of hydrogen by the K-T  
process 13 p0032 A77-12769

Nuclear power for the production of synthetic  
fuels and feedstocks 13 p0035 A77-12790

Air, water, nuclear power make gasoline 13 p0045 A77-12935

Conversion of solar energy by photosynthetic  
production of molecular hydrogen 14 p0143 A77-21316

Entropy production, efficiency, and economy in the  
case of the thermochemical production of  
synthetic fuels - The sulfuric acid-hybrid  
process for thermochemical water decomposition 14 p0145 A77-21544

Upgrading coal liquids to gas turbine fuels. I -  
Analytical characterization of coal liquids 14 p0145 A77-21623

Is commercial coal conversion practical 14 p0146 A77-21761

Shale oil, tar sands, and related fuel sources ---  
Book 14 p0169 A77-23551

Characteristics of synthetic crude from crude  
shale oil produced by in situ combustion retorting 14 p0169 A77-23552

Characterization of synthetic liquid fuels ---  
analytical separation and spectroscopic techniques 14 p0169 A77-23554

## SUBJECT INDEX

## SYNTHETIC FUELS CONTD

- Production of synthetic crude from crude shale oil produced by in situ combustion retorting  
14 p0169 A77-23557
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal  
14 p0171 A77-23718
- Evaluation of the practical aspects of the use of coal derived synthetic fuels  
[ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411
- The H-Coal Process --- liquefaction  
14 p0192 A77-27289
- Implications of utilizing synthetic fuels in combined cycles  
14 p0193 A77-27301
- A petroleum substitute - Active CO2  
14 p0200 A77-29325
- Hydrogenation of lignite with synthesis gas  
14 p0201 A77-29525
- New hydrogen process is in the works  
14 p0205 A77-29789
- Methanol - A clean burning fuel for automobile engines  
14 p0205 A77-29930
- Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process  
15 p0267 A77-32247
- Molecular synthesis in the case of the Fischer-Tropsch synthesis - Reaction steps of the molecular synthesis by means of the catalytic transformation of carbon monoxide and hydrogen  
15 p0268 A77-32248
- Synthesis of substitute natural gas on the basis of coal  
15 p0268 A77-32249
- Synthetic fuels from solid wastes and solar energy  
15 p0275 A77-33336
- The manufacture of hydrogen from coal  
15 p0275 A77-33337
- The K-T process - Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries  
15 p0275 A77-33338
- The Westinghouse Sulfur Cycle for the thermochemical decomposition of water  
15 p0277 A77-33354
- Methanol, past, present, and speculation on the future --- manufacture techniques and fuel applications  
15 p0289 A77-34114
- Aviation turbine fuels from shale and coal oils  
15 p0291 A77-35150
- Synthetic fuels processing: Comparative economics; Proceedings of the Symposium, New York, N.Y., April 4-9, 1976  
15 p0300 A77-36326
- Economic comparison of synthetic fuels - Gasification and liquefaction  
15 p0300 A77-36329
- Economics of synthetic gas production by the SEGAS process  
15 p0302 A77-36341
- North American views of energy choices for the future particularly fluid fuels synthesized from coal  
15 p0307 A77-36807
- EPA resource recovery demonstration - Summary of air emissions analyses  
15 p0313 A77-37630
- Research needs report: Energy conversion research --- Book  
15 p0313 A77-37646
- COGAS status report --- coal processing for clean liquid and gas fuels  
15 p0317 A77-38100
- An integrated process model of the Fischer-Tropsch process for liquid fuels production from coal  
15 p0318 A77-38213
- Synthetic carbonaceous fuel and feedstock using nuclear power, air and water  
15 p0321 A77-38532
- Accounting methods for new-technology non-utility energy installations  
15 p0322 A77-38675
- Options for the conversion of fossil fuels  
15 p0335 A77-39835
- U.S. options for a transition from oil and gas to synthetic fuels  
15 p0335 A77-39836
- Liquid fuels and chemical feedstocks from coal by supercritical gas extraction  
16 p0429 A77-46449
- Synthetic fuels and combustion  
16 p0439 A77-48159
- NOx from fuel nitrogen in two-stage combustion  
16 p0439 A77-48169
- Cassava fuel alcohol in Brazil  
16 p0444 A77-48707
- Alternate fuels for future aircraft  
16 p0444 A77-48709
- Synthetic carbonaceous fuels and feedstocks from oxides of carbon and nuclear power  
16 p0444 A77-48711
- Solid fuels from biomass - Some environmental and economic considerations  
16 p0445 A77-48712
- The prospects for fuels from biomass  
16 p0445 A77-48713
- Fuels and chemicals from the sun through bioconversion  
16 p0488 A77-49076
- Field crops as a future source of fuels and chemical feedstocks  
16 p0489 A77-49080
- A feasibility study of bio-gas production in individual farms in Southwestern Ontario  
16 p0489 A77-49082
- Ignition of droplets of liquid fuels solvent extracted from coal  
16 p0508 A77-51588
- Concurrent carbon gasification and carbon deposition in chars  
16 p0508 A77-51590
- Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary [PB-255994/6] 13 p0107 N77-12533
- Impacts of synthetic liquid fuel development. Automotive market. Volume 2 [PB-255995/3] 13 p0108 N77-12534
- Preliminary economics and comment: In-situ gasification of coal for power and SHG [PB-256034/0] 13 p0109 N77-12554
- A bioenvironmental study of emissions from refuse derived fuel [AD-A024661] 13 p0110 N77-12571
- Some cost, energy, environmental, and resource implications of synthetic fuels produced from coal for military aircraft [AD-A026667] 13 p0118 N77-14271
- Production of a hydrocarbon-type synthetic fuel from wood [NRC-15638] 13 p0127 N77-15210
- Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power [ERDA-76-69] 13 p0130 N77-15506
- Liquid phase methanol [PB-257615/5] 14 p0212 N77-17594
- Changing energy perspectives [UCRL-78153] 14 p0223 N77-19626
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [PB-2307-2] 14 p0224 N77-19637
- Clean fuels from agricultural and forestry wastes [PB-259956/1] 14 p0233 N77-20610
- Enhanced energy utilization from a controlled thermonuclear fusion reactor [PB-260653/1] 14 p0234 N77-20879
- Synthetic fuels from solid wastes and solar energy 14 p0237 N77-21565
- The K-T process: Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 14 p0237 N77-21567
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0243 N77-21627
- US options for a transition from oil and gas to synthetic fuels 14 p0247 N77-21661

## SYSTEM EFFECTIVENESS

## SUBJECT INDEX

- Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system  
[PB-262512/7] 15 p0361 N77-24504
- Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system  
[PB-262513/5] 15 p0361 N77-24505
- International Conference on Hydrogen and its Prospects  
[AD-A036936] 15 p0385 N77-26696
- Utilization of low and intermediate BTU gas from coal for iron ore pelletizing  
[PB-264702/2] 15 p0389 N77-27247
- Alternate aircraft fuels: Prospects and operational implications  
[NASA-TM-X-74030] 16 p0511 N77-28322
- Evaluation of methods to produce aviation Turbine fuels from synthetic crude oils, phase 2, volume 2  
[AD-A036190] 16 p0511 N77-28325
- Biosolar synfuels for transportation  
[UCRL-52208] 16 p0514 N77-28593
- National gas survey. Report to the federal power commission by the Supply-Technical Advisory Task force on the regulatory aspects of substitute gas  
[PB-265677/1] 16 p0519 N77-29323
- The potential role of technological modifications and alternative fuels in alleviating Air Force energy problems  
[AD-A039597] 16 p0525 N77-30261
- US Navy energy R and D  
[AD-A039546] 16 p0529 N77-30623
- An evaluation of very large airplanes and alternative fuels  
[AD-A040532] 16 p0532 N77-31334
- Characterization of substances in products effluents and wastes from synthetic fuel production tests  
[BNWL-2131] 16 p0540 N77-31675
- SYSTEM EFFECTIVENESS**
- Thermal energy storage applied to residential heating systems 13 p0027 A77-12729
- Long term performance prediction of residential solar energy heating systems 13 p0039 A77-12822
- Life-cycle costs and solar energy 13 p0047 A77-13501
- Atlanta /Towns/ solar experiment - The lessons we learned 13 p0047 A77-13503
- Stationary solar concentrators for industrial heating and cooling 13 p0074 A77-19069
- A new method for collector field optimization --- computerized simulation of solar tower facility 13 p0074 A77-19070
- Energy considerations in BEE power systems --- Heliohydroelectric and Helioelectrolytic systems 13 p0077 A77-19099
- A system model for the investigation of alternative energy strategies --- German book 13 p0080 A77-19181
- Performance of an electric van fitted with a hydrodynamic torque converter transmission 14 p0160 A77-22897
- Method for estimating solar heating and cooling system performance 14 p0170 A77-23653
- Initial test results for a solar-cooled townhouse in the mid-Atlantic region 14 p0170 A77-23655
- Performance of low cost solar reflectors for transferring sunlight to a distant collector 14 p0180 A77-25896
- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House 14 p0182 A77-26058
- Solar thermal electric power systems - Manufacturing cost estimation and systems optimization  
[ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474
- Double-exposure collectors with mirrors for solar-heating systems  
[ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476
- A data acquisition, performance evaluation and monitoring system for solar heated/cooled residential dwellings  
[ASME PAPER 76-WA/SOL-13] 14 p0189 A77-26518
- Experimental measurements and system implications of the performance of flat plate solar collector configurations  
[ASME PAPER 76-WA/SOL-14] 14 p0189 A77-26519
- Calculation of long term solar collector heating system performance 15 p0255 A77-30311
- The development of net energy estimates for extraction, handling, and processing of selected fuels 15 p0291 A77-35147
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587
- Lessons learned from Atlanta /towns/ solar experiment --- solar heating and cooling for school 16 p0423 A77-44491
- Improved systems for energy conversion and conservation as pollution control alternatives - USEPA program 16 p0451 A77-48771
- Heating of buildings with solar energy 16 p0474 A77-48959
- Coefficient of performance for solar-powered space cooling systems 16 p0475 A77-48965
- System performance of first residential solar installation in Charlottesville, Virginia, U.S.A. - Retrofitted indoor swimming pool 16 p0479 A77-48999
- Site Data Collection System for solar energy applications 16 p0480 A77-49014
- Minimum Energy Building - The first winter's operation --- solar heated building 16 p0496 A77-49144
- SYSTEMS ANALYSIS**
- Design principles for solar and wind power installations 13 p0015 A77-11922
- The potential for application of energy storage capacity on electric utility systems in the United States. I 13 p0054 A77-15625
- Development of a mobile solar testing and recording /STAR/ system --- trailer for domestic hot water system testing 13 p0072 A77-19047
- The University of Pennsylvania Solar Heating/Cooling System Program 14 p0167 A77-23439
- A methodological survey of energy modeling 14 p0177 A77-24592
- An experimental and analytical investigation of a solar water heater  
[ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- Principles and application of systems in engineering as rational aid for economy, state, and research; Meeting, Bonn, West Germany, November 9, 10, 1976, Communications 14 p0191 A77-27032
- Controllability analysis for passively and actively controlled heat pipes  
[AIAA PAPER 77-776] 15 p0312 A77-37281
- Systems analysis of accelerator and storage ring systems for inertial fusion 15 p0334 A77-39744
- Solar power satellites - A system overview 16 p0463 A77-48868
- Solar industrial steam 16 p0482 A77-49029
- Planning models for the assessment of advanced energy storage systems 13 p0105 A77-12504
- Systems study of fuels from sugar cane, sweet sorghum, and sugar beets  
[TID-27032] 14 p0211 A77-17570
- Solar total energy program  
[SAND-76-0205] 14 p0211 A77-17571
- Solar energy concentration  
[COO-2446-7] 14 p0220 A77-19584
- Coupled dynamics analysis of wind energy systems  
[NASA-CR-135152] 14 p0228 A77-20558



## SUBJECT INDEX

## SYSTEMS ENGINEERING

- Dynamics systems analysis of the relation between energy and the economy  
[BNL-21667] 14 p0235 N77-20931
- Hydrogen in the energy system of The Netherlands  
14 p0247 N77-21660
- Energy model data base program  
[BNL-21545] 14 p0250 N77-21687
- Energy analysis handbook. CAC document 214  
[COO-2865-1] 15 p0372 N77-25635
- Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 N77-26669
- Comparative performance of solar heating with air liquid systems  
[COO-2868-1] 15 p0383 N77-26676
- Simulation study of several solar heating systems with offpeak auxiliary  
[CONF-76C842-13] 15 p0393 N77-27534
- Borehole hydraulic coal mining system analysis  
[NASA-CR-154119] 16 p0512 N77-28558
- Energetics of the United States of America: An atlas  
[BNL-50501] 16 p0522 N77-29615
- High power study - power conditioning --- for magnetohydrodynamic generators and turbine driven alternators  
[AD-A038724] 16 p0522 N77-29625
- The marketability of integrated energy/utility systems  
[PB-266042/1] 16 p0523 N77-29626
- Integrated utility systems: Feasibility study and conceptual design at the University of Florida  
[PB-266043/9] 16 p0523 N77-29627
- Integrated utility systems: Feasibility study and conceptual design at Central Michigan University  
[PB-266044/7] 16 p0523 N77-29628
- Space station systems analysis study. Part 3: Documentation. Volume 1: Executive summary  
[NASA-CR-151503] 16 p0525 N77-30151
- The reporting of federal research and development resources applied to innovation  
[PB-266765/7] 16 p0541 N77-32009
- SYSTEMS ENGINEERING**
- Uranium zirconium hydride reactor space power systems  
[IAF PAPER 76-256] 13 p0004 A77-10953
- ERDA's gas turbine development program for the next decade  
13 p0011 A77-11324
- Energy conservation potential of Modular Integrater Utility Systems /MIUS/  
13 p0026 A77-12724
- Thermionic topping for central station power plants  
13 p0034 A77-12787
- Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800
- Small space station electrical power system design concepts  
13 p0040 A77-12835
- Hydrogen storage via ircon-titanium for a 26 MW/e/ peaking electric plant  
13 p0048 A77-13543
- Wind-power generation on a large scale - A design idea  
13 p0050 A77-14531
- The economic viability of pursuing a space power system concept  
[AIAA PAPER 77-353] 13 p0066 A77-18258
- Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors  
13 p0069 A77-18450
- Aerodynamics as a subway design parameter  
13 p0070 A77-18721
- Selection of optimal pan color for solar water heater  
13 p0078 A77-19104
- Factors affecting the use of solar energy for cooling  
13 p0078 A77-19108
- Environmentally designed housing incorporating solar energy  
13 p0079 A77-19115
- One MW/th/ bench model cavity receiver steam generator --- solar energy conversion system component  
14 p0158 A77-22642
- Comparison of electric drives for road vehicles  
14 p0162 A77-22918
- Engineering development status of the Darrieus wind turbine  
14 p0166 A77-23365
- A practical solar concentrator  
14 p0171 A77-23657
- Operational report on an integrated solar-assisted optimized heat pump system  
14 p0171 A77-23658
- Status of the NASA Space Power Program  
[AIAA PAPER 77-505] 14 p0173 A77-23922
- Advanced photovoltaic power systems  
[AIAA PAPER 77-506] 14 p0173 A77-23923
- Cost optimal deployment of mirrors associated with a high temperature solar energy system  
14 p0181 A77-25901
- Design and costs of high temperature thermal storage devices using salts or alloys  
[ASME PAPER 76-WA/HT-34] 14 p0187 A77-26481
- Heat pipes in flat plate solar collectors  
[ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517
- Principles and application of systems in engineering as rational aid for economy, state, and research; Meeting, Bonn, West Germany, November 9, 10, 1976, Communications  
14 p0191 A77-27032
- Thermal accumulators --- latent heat storage system design  
15 p0264 A77-31673
- Balance and optimization procedure for thermochemical cycles for hydrogen production  
15 p0276 A77-33345
- Potential structural material problems in a hydrogen energy system  
15 p0281 A77-33389
- Evaluation of the Lawrence Livermore Laboratory in-situ coal gasification concept  
15 p0300 A77-36332
- The OTEC answer to OPEC - Solar sea power  
15 p0303 A77-36409
- Solar collection systems - The rationale  
15 p0304 A77-36426
- 100 MWe solar power plant design configuration and performance  
[AAS 75-288] 15 p0305 A77-36556
- Sandia studies for ERDA central receiver thermal electric power project --- Solar generating system  
15 p0318 A77-38208
- A solar heating system simulation model  
15 p0319 A77-38222
- Materials consideration for the Bigas coal gasification pilot plant  
[ASME PAPER 76-PVP-41] 15 p0323 A77-38825
- Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser  
15 p0326 A77-39532
- Status of the reference dual-cycle MHD-steam power plant  
15 p0332 A77-39577
- Particle Accelerator Conference: Accelerator Engineering and Technology, Chicago, Ill., March 16-18, 1977, Proceedings  
15 p0334 A77-39742
- Strategy of pollution control --- Book  
16 p0400 A77-40673
- Simulation analysis of passive solar heated buildings - Preliminary results  
16 p0406 A77-41582
- A large solar heating system for a Saudi campus complex  
16 p0430 A77-46550
- A study of the effects of new transportation systems on urban transportation and environment by computer simulation  
16 p0430 A77-86652
- Design of a low cost space heating system using warm geothermal or industrial effluents  
[ASME PAPER 77-DE-26] 16 p0432 A77-46909
- Coal gasification combined-cycle pilot plant system analysis  
16 p0446 A77-48724
- The design of a sodium sulfate decahydrate heat exchanger for coolness storage --- in solar-powered air conditioning system  
16 p0450 A77-48760
- Geothermal well stimulation with a secondary fluid  
16 p0454 A77-48795

Energy extraction characteristics of hot dry rock geothermal systems 16 p0455 A77-48798

A comparison of three working fluids for the design of geothermal power plants 16 p0455 A77-48800

Design of the Montana Magneto-hydrodynamics Component Development and Integration Facility 16 p0458 A77-48822

A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute 16 p0458 A77-48823

Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825

Compressed air storage for load leveling of nuclear power plants 16 p0459 A77-48826

Development status of the fixed mirror solar concentrator 16 p0460 A77-48834

Solar cell array for concentrated sunlight 16 p0460 A77-48836

Miniature solar-electric power system 16 p0462 A77-48848

The Page-Jackson Elementary School solar heating and cooling system 16 p0462 A77-48851

Space power system design and development from an economic point of view 16 p0464 A77-48872

Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923

Simulation study of solar heat pump systems 16 p0477 A77-48982

Unified simulation capability for solar heating and cooling system analysis 16 p0479 A77-49003

A design procedure for solar air heating systems 16 p0480 A77-49006

A structural design process for solar energy systems 16 p0480 A77-49012

Smith multimodule solar-electric plant 16 p0482 A77-49023

Turntable solar arrays 16 p0483 A77-49033

Economic aspects of Ocean Thermal Energy Conversion 16 p0484 A77-49041

A parametric study of critical fuel costs for solar heating in North America 16 p0493 A77-49118

User needs vs. technical demands, or the art of tradeoff in making a good, inexpensive solar home 16 p0495 A77-49134

A design procedure for solar air heating systems 16 p0501 A77-50209

Utility distribution systems in Iceland [AD-A026956] 13 p0126 N77-14957

Integrating community utilities for resource conservation [PB-256898/8] 13 p0133 N77-15923

A non-tracking solar energy collector system [NASA-CASR-WFO-13813-1] 14 p0220 N77-19579

Technical and economic feasibility of thermal energy storage [COO-2558-1] 14 p0222 N77-19605

Wind-powered hydrogen electric systems for farm and rural use [PB-259318/4] 14 p0226 N77-19667

Regional variations of solar radiation with application to solar energy system design [PB-259379/6] 14 p0226 N77-19708

Central receiver solar thermal system, phase 1, CPRL item 10 [SAN/1108-76/2] 14 p0231 N77-20591

Economic and technical feasibility study for energy storage flywheels [ERDA-76-65] 14 p0249 N77-21685

Design techniques for modular integrated utility systems --- energy production and conversion efficiency [NASA-TM-X-58189] 14 p0253 N77-22005

Geohydrological environmental effects of geothermal power production, phase 2A [PB-261687/8] 15 p0347 N77-22653

Program document for Energy Systems Optimization Program 2 (ESOP2) Volume 1: Engineering manual [NASA-CR-151422] 15 p0372 N77-25631

Experimental two-phase liquid-metal magneto-hydrodynamic generator program [AD-A035245] 15 p0387 N77-26988

Study of Lyndon B. Johnson Space Center utility systems [NASA-TM-58196] 15 p0388 N77-27161

Engineering analysis and testing of water-trickle solar collector [ORO-4927-76-2] 15 p0391 N77-27506

Performance of a solar heating system utilizing phase-change energy storage [CONF-760842-11] 15 p0393 N77-27540

Technical review and analysis of the total utility demonstration plant design and operational concept [AD-A037016] 15 p0398 N77-28040

Engineering study of the module/array interface for large terrestrial photovoltaic arrays [ERDA/JPL-954698-77/1] 16 p0528 N77-30609

NASA thermionic-conversion program [NASA-TM-X-73644] 16 p0535 N77-31612

Systems studies of energy conservation: Methane produced from coalbeds, volume 1 [MERC/CR-77/4-VOL-1] 16 p0558 N77-33660

**SYSTEMS MANAGEMENT**

Electric load management and energy conservation 14 p0137 A77-20685

**SYSTEMS STABILITY**

Solar pond stability experiments 16 p0482 A77-49028

## T

**TABLES (DATA)**

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137926] 13 p0126 N77-15007

Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system [NASA-CR-137927] 13 p0126 N77-15008

**TANKER SHIPS**

The importation of liquefied natural gas 14 p0194 A77-27607

Being prepared for future Argo Merchants --- tanker oil spill prevention 16 p0425 A77-45228

Ship steel weldments for low temperature service [PB-256997/8] 13 p0103 N77-12203

Destator test program evaluation [AD-A034260] 15 p0360 N77-24410

**TANKS (CONTAINERS)**

Automotive hydride tank design 15 p0282 A77-33399

A study to obtain verification of Liquid Natural Gas (LNG) tank loading criteria [AD-A025716] 13 p0120 N77-14492

**TANTALUM OXIDES**

The sawtooth coverslide - A new means of coupling light into solar cells 15 p0298 A77-36263

**TAR SANDS**

Shale oil, tar sands, and related fuel sources --- Book 14 p0169 A77-23551

Sulfur compounds in oils from the Western Canada Tar Belt 14 p0169 A77-23553

Characterization of synthetic liquid fuels --- analytical separation and spectroscopic techniques 14 p0169 A77-23554

Characterization of a Utah tar sand bitumen 14 p0170 A77-23561

The Asphalt Ridge tar-sand deposits 14 p0193 A77-27347

Field experiment of in-situ oil recovery from a Utah tar sand by reverse combustion 14 p0193 A77-27348

Recovery of bitumen from oil-impregnated sandstone deposits of Utah 14 p0194 A77-27349

The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study 16 p0438 A77-47765

# SUBJECT INDEX

# TECHNOLOGY ASSESSMENT

Production and processing of US tar sands: An environmental assessment [PB-266266/6] 16 p0513 N77-28575

**TARGET ACQUISITION**  
Performance optimization of an air-to-air missile design 15 p0289 A77-34298

**TECHNOLOGICAL FORECASTING**  
ERDA's gas turbine development program for the next decade 13 p0011 A77-11324

The next-generation subsonic transport [SAWE PAPER 1127] 13 p0016 A77-12195

The long-range prospects for solar-derived fuels 13 p0017 A77-12240

Off-shore oil scenarios - Method and results 13 p0018 A77-12282

Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis 13 p0029 A77-12745

Transport of the future and the tasks of science 13 p0048 A77-13643

Energy and environment post-2000 13 p0050 A77-14560

The pay-off for advanced technology in commercial aircraft design and operation 13 p0071 A77-19012

The energy crisis today - A perspective 14 p0137 A77-20390

Air transport propulsion for the 1980's 14 p0138 A77-20717

The principles of system studies in nuclear energy research 14 p0157 A77-22342

The current state and prospects for development of controlled thermonuclear fusion 14 p0157 A77-22537

Impacts of future use of electric cars in US cities 14 p0161 A77-22902

Low-Btu gas from coal has many potential markets 14 p0165 A77-23309

Space battery technology for the 1980s [AIAA PAPER 77-482] 14 p0172 A77-23902

Prospects for fusion energy 14 p0178 A77-24928

The future with fusion power 14 p0205 A77-29938

Report on Joint Conference Endo Foundation Board of Directors and Board of Consultants, October 13 and 14, 1976 15 p0260 A77-31064

The impact of the new energy technologies 15 p0272 A77-33124

Hydrogen energy - Its potential promises and problems 15 p0284 A77-33410

Technology impact assessment of the hydrogen economy concept - Key findings 15 p0284 A77-33414

Hydrogen use projections and supply options 15 p0285 A77-33418

The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496

Energy research overview - Alternatives for energy development [AAS 75-280] 15 p0304 A77-36555

The year 2000 - Energy enough 15 p0306 A77-36725

North American views of energy choices for the future particularly fluid fuels synthesized from coal 15 p0307 A77-36807

Trends in western Europe --- lignite gasification cost effectiveness 15 p0308 A77-36808

Future trends in electrical energy generation economics in the United States 15 p0317 A77-37960

The next 25 years: Industrialization of space - Rationale for planning 15 p0322 A77-38792

The significance of nuclear energy for satisfying future energy requirements 15 p0333 A77-39649

U.S. options for a transition from oil and gas to synthetic fuels 15 p0335 A77-39836

The future of solar-thermal small-scale power stations 15 p0336 A77-39981

Energy forecasts yesterday and today 16 p0400 A77-40683

Perspectives on implementing OTEC power --- Ocean Thermal Energy Conversion [AIAA 77-1024] 16 p0404 A77-41564

Competitive restraints on air travel - Ground modes and telecommunications 16 p0409 A77-41939

A view of the future - Constraints and opportunities --- aviation effects on world structure 16 p0410 A77-41944

Economic aspects of U.S. energy independence in the coming decade 16 p0411 A77-42165

Large-scale space operations for Solar Power Satellites [AIAA PAPER 77-1031] 16 p0413 A77-42483

Putting alternative sources of energy into prospective 16 p0414 A77-42633

An econometric analysis of energy over the next 75 years 16 p0414 A77-42637

Patterns of energy use and the critical choices ahead 16 p0415 A77-42856

Some impacts of restricting nuclear energy availability 16 p0415 A77-42857

Energy supply of the Federal Republic of Germany 16 p0419 A77-43566

Energy supply to the year 2000: Global and national studies --- Book 16 p0428 A77-46093

A space station for the 1980's - A look at the next generation of operational systems and their functional requirements [ASME PAPER 77-ENAS-37] 16 p0432 A77-46878

Combustion technology for the improvement of engine efficiency and emission characteristics 16 p0440 A77-48172

An analysis of the technology role in US power during the mid-range period [AD-A024042] 13 p0102 N77-11927

Air transportation beyond the 1980's 13 p0117 N77-13984

Domestic and world trends (1980 - 2000) affecting the future of aviation [NASA-CR-144838] 13 p0126 N77-14981

Economic analysis of the need for advanced power sources [HEDL-SA-989] 13 p0131 N77-15509

Residential energy use alternatives to the year 2000 [CONF-760648-1] 14 p0223 N77-19625

Study of future paratransit requirements [PB-264082/9] 15 p0376 N77-26028

Analysis and forecast of electrical distribution system materials. Volume 3: Appendix [CONS/2050-1-VOL-3-APP] 16 p0551 N77-33430

**TECHNOLOGIES**  
JPL basic research review --- research and advanced development [NASA-CR-152689] 15 p0357 N77-23894

**TECHNOLOGY ASSESSMENT**  
The options for using the sun 13 p0001 A77-10318

Evolution of thermal traction - From the diesel engine to the gas turbine 13 p0004 A77-10976

The energy problem and the earth's fuel situation 13 p0004 A77-11027

Intermetallic compounds - Background and results of twenty years of research 13 p0014 A77-11600

Coming - Solar power plants 13 p0016 A77-12125

The long-range prospects for solar energy 13 p0017 A77-12237

New electrochemical current sources 13 p0020 A77-12650

Small electric vehicle considerations in view of performance and energy usage 13 p0024 A77-12698

- Diversification as an energy conservation strategy  
13 p0027 A77-12725
- MHD power generation - 1976 Status Report ---  
coal-fired design  
13 p0033 A77-12782
- Current status of the magnetic fusion program  
13 p0035 A77-12792
- SEP solar array technology development  
13 p0040 A77-12825
- Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility  
13 p0043 A77-12867
- The U-240 cyclotron --- review of systems and  
processes  
13 p0046 A77-13151
- Hypersonic technology-approach to an expanded  
program  
13 p0051 A77-14597
- Heat pipe theory and practice --- Book  
13 p0052 A77-14825
- Studies and thoughts on nuclear reactor systems  
13 p0055 A77-15800
- The prospect for fusion --- controlled nuclear  
fusion  
13 p0058 A77-16357
- Potentialities and limitations of the utilization  
of wind machines  
13 p0061 A77-16787
- LTA - Recent developments --- Lighter Than Air ships  
13 p0061 A77-17021
- Solar photovoltaics - An aerospace technology  
[AIAA PAPER 77-293]  
13 p0065 A77-18225
- A system model for the investigation of  
alternative energy strategies --- German book  
13 p0080 A77-19181
- Commuter van programs - An assessment  
14 p0137 A77-20391
- ECAS MHD system studies --- Energy Conversion  
Alternatives Study  
14 p0142 A77-21268
- Assessment of high-efficiency solar cells  
performance  
14 p0148 A77-21785
- The current state and prospects for development of  
controlled thermonuclear fusion  
14 p0157 A77-22537
- Opportunities for battery powered  
road vehicles  
14 p0160 A77-22892
- Near-term advanced electric vehicle batteries  
14 p0161 A77-22909
- The national laser-fusion program  
14 p0168 A77-23502
- Status of large neodymium glass lasers  
14 p0168 A77-23503
- Why solar energy --- advantages over fossil fuel  
and nuclear energy  
14 p0170 A77-23654
- Advanced low-mass solar array technology  
[AIAA PAPER 77-488]  
14 p0173 A77-23908
- Advanced photovoltaic power systems  
[AIAA PAPER 77-506]  
14 p0173 A77-23923
- Status of silicon solar cell technology  
14 p0184 A77-26392
- A preliminary assessment of solar energy technology  
[ASME PAPER 76-WA/TS-1]  
14 p0190 A77-26531
- Current status of the BI-GAS process  
14 p0193 A77-27300
- Assessment of satellite power stations  
[AIAA PAPER 77-552]  
15 p0266 A77-32069
- Water splitting - A progress report --- hydrogen  
production using high temperature gas-cooled  
reactor  
15 p0274 A77-33330
- The NASA Hydrogen Energy Systems Technology Study  
- A summary  
15 p0284 A77-33413
- Thermonuclear fusion power  
15 p0296 A77-35920
- Economic evaluation by ERDA of alternative fossil  
energy technologies  
15 p0300 A77-36328
- The relative advantages of coal conversion routes  
for electric power generation --- economics of  
large scale installations  
15 p0300 A77-36330
- Progress in switching technology for MTS systems  
--- Magnetic Energy Transfer and Storage  
15 p0303 A77-36377
- Conventional gasification technologies  
15 p0308 A77-36810
- Gasification and generation of electricity ---  
coal utilization  
15 p0308 A77-36812
- Clean fuels from biomass, sewage, urban refuse,  
agricultural wastes; Proceedings of the  
Symposium, Orlando, Fla., January 27-30, 1976  
15 p0313 A77-37652
- Wastes and biomass as energy resources - An overview  
15 p0313 A77-37654
- A review of gasification for power generation  
15 p0322 A77-38790
- New options in energy technology; Proceedings of  
the Conference, San Francisco, Calif., August  
2-4, 1977  
16 p0402 A77-41551
- Storage batteries - The case and the candidates  
[AIAA 77-1007]  
16 p0403 A77-41554
- Improvement in phosphoric acid cell powerplant  
technology  
16 p0403 A77-41558
- Economic assessment of the utilization of fuel  
cells in electric utility systems  
[AIAA 77-1012]  
16 p0403 A77-41559
- Introduction to the ERDA electric and hybrid  
demonstration program --- electric and hybrid  
vehicle research and development  
16 p0420 A77-43675
- The development of a 150 kW /200 HP/ Stirling  
engine for medium duty automotive application -  
A status report  
[SAB PAPER 770081]  
16 p0424 A77-44559
- Gas turbine evolution  
16 p0429 A77-46402
- The industrial gas turbine - Its status and  
prospects  
16 p0429 A77-46408
- Prospects for satellite power stations  
[AAS 76-058]  
16 p0430 A77-46639
- Rechargeable batteries in Japan --- Book  
16 p0431 A77-46783
- Clean fusion concepts and efforts - A survey  
16 p0435 A77-47356
- Space-based solar power study near completion  
16 p0442 A77-48480
- Further Stirling engine development work. I  
16 p0442 A77-48496
- Science and technology of oil shale --- Book  
16 p0442 A77-48502
- Development of the Westinghouse coal gasification  
process - A status report  
16 p0446 A77-48722
- Advanced fuel cell technology and applications  
16 p0447 A77-48735
- Recent progress in development of sodium-sulfur  
battery for utility application  
16 p0448 A77-48740
- Environmental considerations in advanced energy  
conversion technology assessments  
16 p0452 A77-48717
- Environmental assessment of advanced energy  
conversion technologies  
16 p0452 A77-48778
- Progress in channel development for direct coal  
fired MHD  
16 p0458 A77-48824
- Development status of the fixed mirror solar  
concentrator  
16 p0460 A77-48834
- Sharing the sun: Solar technology in the  
seventies; Proceedings of the Joint Conference,  
Winnipeg, Canada, August 15-20, 1976. Volumes 1-10  
16 p0469 A77-48910
- Present state and perspective of solar energy  
applications in Mexico  
16 p0469 A77-48911
- The current technology for solar heating and cooling  
16 p0470 A77-48919
- Solar collectors --- for heating and cooling of  
buildings  
16 p0471 A77-48935
- Status of the ERDA photovoltaic materials and  
device studies  
16 p0486 A77-49056
- High temperature thermal energy storage  
16 p0491 A77-49099

## SUBJECT INDEX

## TECHNOLOGY TRANSFER

- An assessment of hydrogen as a means to store solar energy 16 p0492 A77-49107
- Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- Solar energy: A U.K. assessment --- Book 16 p0503 A77-50688
- Status of sulfur dioxide removal systems for the electric utility industry 16 p0504 A77-51144
- Studies of technological processes by solar energy under cosmic simulated conditions [IAP PAPBE 77-54] 16 p0506 A77-51411
- Underground coal mining: An assessment of technology [PB-255726/2] 13 p0093 N77-10974
- Bosch technical instruction. Gasoline injection D and L-jetronic [NASA-TT-P-17111] 13 p0095 N77-11399
- Mathematics for energy [PB-252463/5] 13 p0098 N77-11543
- The use of an interactive energy model for technology assessment with special reference to underground coal gasification [PB-255543/1] 13 p0098 N77-11545
- Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy [PB-255656/7] 13 p0100 N77-11561
- Development of 20 percent efficient solar cell [PB-255903/7] 13 p0108 N77-12548
- Assessment of cadmium sulfide photovoltaic arrays for large scale electric utility applications [PB-255646/2] 13 p0109 N77-12551
- Survey of alcohol fuel technology, volume 1 [PB-256007/6] 13 p0112 N77-13232
- Survey of alcohol fuel technology, Volume 2 [PB-256008/4] 13 p0112 N77-13233
- NASA Office of Aeronautics and Space Technology Summer Workshop. Volume 4: Power technology panel [NASA-TN-X-73964] 13 p0117 N77-13913
- Economic and technical feasibility study of compressed air storage [COO-2559-1] 13 p0122 N77-14593
- Satellite power system: Engineering and economic analysis summary [NASA-TN-X-73344] 13 p0128 N77-15486
- Energy and technology review [UCID-52000-76-2] 13 p0131 N77-15508
- Nuclear unit productivity analysis [PB-257553/8] 13 p0132 N77-15528
- Solar total energy program [SAND-76-0205] 14 p0211 N77-17571
- Conceptual study for total utilization of an intermediate temperature geothermal resource [ANCR-1260] 14 p0211 N77-17579
- Results of baseline tests of the Lucas Limousine [NASA-TN-X-73609] 14 p0214 N77-17947
- Fuel and energy production by bioconversion of waste materials: State-of-the-art [PB-258499/3] 14 p0219 N77-19279
- Experimental and analytical research on the aerodynamics of wind turbines [COO-2615-76-T-1] 14 p0223 N77-19613
- Technical and economic aspects of potential US district heating systems [BNL-21287] 14 p0232 N77-20594
- Technology evaluation report, commercial buildings [COO-2683-76-1] 14 p0232 N77-20603
- Assessment of laser-driven fusion [PB-260691/1] 14 p0234 N77-20880
- Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 N77-21634
- Energy for rural development: Renewable resources and alternative technologies for developing countries [PB-260606/9] 14 p0251 N77-21716
- Design techniques for modular integrated utility systems --- energy production and conversion efficiency [NASA-TN-X-58189] 14 p0253 N77-22005
- Solar energy environmental and resource assessment program [ERDA-76-138] 15 p0344 N77-22621
- Environmental research needs for coal conversion and combustion technologies [PB-262159/7] 15 p0347 N77-22659
- Technology assessment of laser-fusion power production [LA-OR-76-2060] 15 p0351 N77-22975
- AFPS - subsatellite assessment study, volume 1 [NBB-URV-91-76-VOL-1] 15 p0354 N77-23175
- Two investigations of flat-plate solar collector performance 15 p0355 N77-23598
- JPL basic research review --- research and advanced development [NASA-CR-152689] 15 p0357 N77-23894
- Combustion additives for pollution control: A state-of-the-art review [PB-264068/8] 15 p0359 N77-24316
- Evaluation of the technical and economic feasibility of mirror fusion devices [UCRL-13695] 15 p0386 N77-26977
- Automated array assembly task, phase 1 [NASA-CR-153909] 15 p0391 N77-27505
- Survey of technology for storage of thermal energy in heat transfer salt [ORNL-TM-5682] 15 p0392 N77-27513
- Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters [ANL-ES-54] 15 p0394 N77-27547
- Technical review and analysis of the total utility demonstration plant design and operational concept [AD-A037016] 15 p0398 N77-28040
- The hydrogen economy: A preliminary technology assessment [PB-266607/1] 16 p0512 N77-28329
- Geothermal energy, an environmental and safety mini-overview survey [ATR-77(7518)-1] 16 p0514 N77-28590
- Space technology in the discovery and development of mineral and energy resources 16 p0526 N77-30289
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-155042] 16 p0546 N77-32594
- Role of fusion as a future power source [IAEA-CN-36/428] 16 p0549 N77-32895
- Technology requirements for advanced earth-orbital transportation systems: Summary report --- single stage to orbit vehicles [NASA-CR-2867] 16 p0550 N77-33255
- Compendium of critiques of JPL report SP-43-17: Automotive technology status and projections project [NASA-CR-155180] 16 p0552 N77-33519
- TECHNOLOGY TRANSFER
- OTEC - Aerospace and ocean engineering in partnership --- Ocean Thermal Energy Conversion [AIAA PAPBE 77-296] 13 p0066 A77-18227
- Gas turbine electric powerplants [AIAA PAPBE 77-386] 13 p0066 A77-18254
- Miniature applications for photovoltaic generators 14 p0155 A77-21853
- The competitive market for commercial VSTOL [AIAA 77-573] 15 p0290 A77-34933
- Adapting the experience of DOD/Industry to developing fusion power reactors [AIAA 77-1019] 16 p0404 A77-41561
- Thermal energy management techniques in spacecraft design and their potential for terrestrial applications 16 p0439 A77-47969
- System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications 16 p0445 A77-48718
- Potential for energy conservation technology transfer [CONF-760536-1] 14 p0211 N77-17573
- InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 3: National solar demonstration program [COO-2688-76-6-VOL-3] 14 p0224 N77-19634
- ERDA Interlaboratory Work for Data Exchange (IWDE) [LBL-5329] 15 p0352 N77-22998
- Space benefits: The secondary application of aerospace technology in other sectors of the economy [NASA-CR-152685] 15 p0352 N77-23010

# TECHNOLOGY UTILIZATION

# SUBJECT INDEX

Technology transfer from foreign direct investment in the United States. Report of a seminar series [PB-263012/7] 15 p0358 N77-24018

Hawaii technology utilization experiment [UCID-17343] 15 p0398 N77-28038

Proceedings of the ASPE/MSFC Symposium on Engineering and Productivity Gains from Space Technology [NASA-CR-2019] 16 p0525 N77-30273

ERDA/NASA-MSFC solar heating and cooling development and demonstration program 16 p0525 N77-30274

Early use of solar energy in buildings. A study of barriers and incentives to the widespread use of solar heating and cooling systems [PB-267832/4] 16 p0539 N77-31663

Spinoff 1977: An annual report [NASA-TM-74908] 16 p0561 N77-34049

**TECHNOLOGY UTILIZATION**

Prospects for coal as a direct fuel and its potential through application of liquefaction and gasification technology 13 p0008 A77-11241

Prospects for solar energy utilization in Iran - Photothermal methods 13 p0013 A77-11532

Application of advanced technology to future long-range aircraft [SAWR PAPER 1126] 13 p0016 A77-12194

Alkali metal space power technology applicable to national energy research and development [AIAA PAPER 77-289] 13 p0065 A77-18223

The application of aerospace technology to solar thermal electric power generation [AIAA PAPER 77-294] 13 p0065 A77-18226

Photovoltaic effect applications 13 p0075 A77-19080

Solar energy in Switzerland 13 p0080 A77-19127

Principles of atomic central heating 14 p0136 A77-20102

Operational chemical storage cycles for utilization of solar energy to produce heat or electric power 14 p0158 A77-22646

Applications of cryogenic technology. Volume 8 --- Book 14 p0159 A77-22868

Superalloys - Their use and requirements in advanced energy systems 14 p0196 A77-28322

Solar technology: Solar energy in practical application /3rd revised and enlarged edition/ --- German book 15 p0271 A77-33113

Combined utilization of nuclear and organic fuels 15 p0272 A77-33159

Analysis of a Delphi study on hydrogen --- questionnaire survey on future energy utilization 15 p0284 A77-33411

Space Congress, 14th, Cocoa Beach, Fla., April 27-29, 1977, Proceedings 15 p0294 A77-35301

The University of Florida solar house 15 p0294 A77-35317

Thin films in energy systems --- for energy conserving structural materials 15 p0306 A77-36673

Application of solar energy in Belgium - Study of a flat plate collector --- Flemish book on materials, applications and design parameters 15 p0324 A77-39499

Electrochemical energy conversion. II - Utilities, marine and space applications 16 p0400 A77-40686

The roles of aerospace organizations in energy development or can aerospace success bring success in energy [AIAA PAPER 77-1001] 16 p0408 A77-41855

Large-scale applications of superconductivity 16 p0412 A77-42475

Aerospace and HVACER: Spinoff '77 - Reaping the dividends --- Heating, Ventilation, Air Conditioning, and Refrigeration 16 p0427 A77-45918

The space station and space industrialization [AAS 76-050] 16 p0430 A77-46633

Practicability study of Stirling total energy systems 16 p0465 A77-48882

Commercial applications of solar total energy systems 16 p0468 A77-48904

Solar thermal system requirements 16 p0481 A77-49017

Utilization of geothermal energy [UTIAS-REVIEW-40] 13 p0087 N77-10644

SEASAT - A candidate ocean industry economic verification experiments [NASA-CR-149228] 13 p0104 N77-12476

Thin film solar cells for terrestrial applications [PB-255606/6] 13 p0109 N77-12553

National benefits associated with commercial application of fuel cell powerplants [ERDA-76-54] 13 p0123 N77-14597

Flywheel-heat engine power for an energy-economic personal vehicle [BNWL-2006] 14 p0214 N77-18448

Coal technology program [ORNL-5159] 14 p0216 N77-18568

Navy applications for terrestrial photovoltaic solar power [AD-A030529] 14 p0218 N77-18590

Energy storage: User needs and technology applications [CONF-760212-SUMM] 14 p0222 N77-19604

Commercial application of laser fusion [LA-UR-76-1459] 14 p0227 N77-19872

Modern technology electrolysis for power application --- concerning hydrogen production 14 p0239 N77-21598

Multi-mission uses for prop-fan propulsion 15 p0339 N77-22127

Applications of aerospace technology to petroleum exploration. Volume 1: Efforts and results [NASA-CR-152694] 15 N77-22741

Applications of aerospace technology to petroleum exploration. Volume 2: Appendices [NASA-CR-152693] 15 p0351 N77-22742

Space benefits: The secondary application of aerospace technology in other sectors of the economy [NASA-CR-152685] 15 p0352 N77-23010

Ceramic applications in the advanced Stirling automotive engine [NASA-TM-X-73632] 15 p0354 N77-23487

NASA Technology Utilization House technical support package [NASA-TM-X-74686] 15 p0358 N77-24011

RAWN utilization experience (case studies 32 through 41) --- research applied to national needs [PB-263683/5] 15 p0370 N77-25027

Identifying and analyzing methods for reducing the energy consumption of helicopters [NASA-CR-144953A] 15 p0388 N77-27104

Advanced technology fuel cell program [EPRI-EM-335] 15 p0391 N77-27508

Hawaii technology utilization experiment [UCID-17343] 15 p0398 N77-28038

Cell and module test procedures seen from the manufacturer and the user point of view 16 p0527 N77-30537

Mineral resources: Potentials and problems [USGS-CIRC-698] 16 p0544 N77-32563

**TELECOMMUNICATION**

Competitive restraints on air travel - Ground modes and telecommunications 16 p0409 A77-41939

**TELEVISION RECEIVERS**

Use of solar generators in Africa for broadcasting equipment 15 p0256 A77-30320

**TEMPERATE REGIONS**

Investigation into the use of large-scale total-energy systems in mild and warm climates 16 p0401 A77-41318

**TEMPERATURE**

Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir [PB-262391/6] 14 p0252 N77-21731

Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors [SAND-76-5061] 15 p0345 N77-22635

# SUBJECT INDEX

# TEMPERATURE PROFILES

## TEMPERATURE CONTROL

Flight results of a cryogenic cooler designed for Meteosat  
[IAF PAPER 76-210] 13 p0003 A77-10942

Optimal control of flow in low temperature solar heat collectors  
13 p0019 A77-12409

Status of development and application of gas-stabilized heat-pipe radiators  
[DGLR PAPER 76-192] 13 p0060 A77-16557

Temperature optimization for power production of infinite heat transfer solar absorbers  
13 p0073 A77-19055

The heat pipe heat bridge and thermal controller  
[AIAA PAPER 77-751] 15 p0311 A77-37264

The multistage heat pipe radiator - An advancement in passive cooling technology  
[AIAA PAPER 77-760] 15 p0312 A77-37271

Cryogenic temperature control by means of energy storage materials --- for long space voyages  
[AIAA PAPER 77-763] 15 p0312 A77-37273

A precise satellite thermal control system using cascaded heat pipes  
[AIAA PAPER 77-777] 15 p0312 A77-37282

Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512

Development of a low temperature phase change material package --- for spacecraft thermal control  
[AIAA PAPER 77-762] 15 p0325 A77-39514

Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers  
15 p0330 A77-39564

Thermal energy management techniques in spacecraft design and their potential for terrestrial applications  
16 p0439 A77-47969

Development of space applications of heat pipes at Aérospatiale  
13 p0120 N77-14390

Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on)  
[NASA-CR-150152] 13 p0127 N77-15347

The design of a solar energy collection system to augment heating and cooling for a commercial office building  
[NASA-TM-X-72753] 14 p0207 N77-16446

Plan for developing moderate temperature/low salinity geothermal resources  
[ANCR-1318] 14 p0223 N77-19614

Magnetic heat pumping  
[NASA-CASE-LEW-12508-2] 16 p0543 N77-32435

## TEMPERATURE DISTRIBUTION

Transient performance characteristics of a high temperature distributed solar collector field  
13 p0037 A77-12810

Recovery of heat energy from deep or shallow aquifers  
14 p0175 A77-24206

Some aspects of heat and mass transfer in geothermal wells  
14 p0175 A77-24209

Storage tanks - A numerical experiment --- for solar heating  
14 p0180 A77-25898

Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe  
15 p0306 A77-36708

Study of the characteristics of convective heat transfer in cylindrical solar energy receivers by solving the conjugate problem of heat exchange  
15 p0316 A77-37771

Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem  
16 p0437 A77-47427

Natural convection phenomena in inclined cells with finite side-walls - A numerical solution --- solar energy absorption cells  
16 p0500 A77-50201

Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls  
[NASA-TN-D-8396] 14 p0207 N77-16445

Performance characteristics of a high-pressure, moderate temperature, electrolysis system  
14 p0238 N77-21595

## TEMPERATURE EFFECTS

A new hydrogen storage electrode  
13 p0047 A77-14539

Efficiency tests on a linear parabolic concentrator for medium and high temperatures  
13 p0077 A77-19104

Details of hydrogen-burning thermonuclear reactions  
14 p0168 A77-23457

Development of nickel-zinc batteries for aircraft  
14 p0195 A77-28148

Temperature dependence of the 10.6-microns reflectivity of ITO-coated silicon --- selective absorber for solar energy conversion application  
14 p0200 A77-29246

Performance of n+/p silicon solar cells in concentrated sunlight  
15 p0258 A77-30729

Thermally induced migration of hydrocarbon oil  
15 p0268 A77-32375

Water electrolysis under pressure - Improvement of energy efficiency by temperature increase  
15 p0277 A77-33360

Fundamentals of coal gasification  
15 p0308 A77-36809

Electrical conductivity of molten coal slags containing potassium seed  
15 p0330 A77-39565

Comparative kinetics of high-temperature reaction between H<sub>2</sub>S and selected metal oxides  
16 p0424 A77-44608

The storability of Li/SO<sub>2</sub> cells  
16 p0447 A77-48730

Temperature effects of crude oil in the upper intertidal zone  
[PB-255956/5] 13 p0110 N77-12581

Thermal effects on biodegradation of pollutants in water  
[PB-261512/8] 15 p0350 N77-22709

Thermal barrier coating on high temperature industrial gas turbine engines  
[NASA-CR-135147] 15 p0390 N77-27496

Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature  
[NASA-CR-155166] 16 p0553 N77-33604

## TEMPERATURE GRADIENTS

Geothermal sources and their utilization  
13 p0055 A77-15803

Thermal energy of oceans  
14 p0153 A77-21833

Computing residuals in geothermal research by I.R. scanning  
16 p0431 A77-46768

## TEMPERATURE INVERSIONS

On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs  
16 p0454 A77-48796

## TEMPERATURE MEASUREMENT

The status of instrumentation and process control techniques for in situ coal gasification  
14 p0191 A77-26790

A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel  
15 p0283 A77-33407

Synergistic effects of shadowing on a solar collector matrix  
[SAND-76-0012] 13 p0122 N77-14587

On shallow-hole temperature measurements. A test study in the Salton Sea geothermal field  
[PB-262643/0] 15 p0343 N77-22602

## TEMPERATURE PROFILES

Results of some geothermal studies in Singhbhum thrust belt, India  
13 p0013 A77-11499

Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile --- for coal-fired gas turbines  
14 p0145 A77-21698

Gas-solid heat transfer coefficients in beds of crushed oil shale  
14 p0196 A77-28472

High temperature solar collector with an Archimedes concentrator  
16 p0460 A77-48833

**TENNESSEE VALLEY (AL-KY-TN)**  
 Study of the feasibility of a regional solid waste derived fuel system in the Tennessee Valley Authority service area [PB-259764/9] 14 p0227 N77-19956

**TERMINAL FACILITIES**  
 Emergency power plant of rapid availability for the Berlin-Tegel airport 13 p0001 A77-10324

**TERMINOLOGY**  
 National gas survey. Report to the federal power commission by the Supply-Technical Advisory Committee Study Subgroup on reserves and resources classifications [PB-265878/9] 16 p0519 N77-29324

**TERNARY ALLOYS**  
 Thermal storage in metals 16 p0492 A77-49105

**TERRAIN ANALYSIS**  
 Determination of average ground reflectivity for solar collectors 16 p0471 A77-48933

**TERRESTRIAL RADIATION**  
 Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories 16 p0433 A77-47201

**TEST EQUIPMENT**  
 Solar properties of materials and testing of solar systems 15 p0294 A77-35318  
 Small scale tests on control methods for some liquefied natural gas hazards [AD-A033522] 15 p0341 N77-22293

**TEST FACILITIES**  
 Superconducting magnets for an MHD test facility and base load power plant 14 p0144 A77-21379  
 East Mesa Geothermal Component Test Facility 14 p0178 A77-25136  
 The behavior of iron titanium hydride test beds - Long-term effects, heat transfer and modeling 15 p0280 A77-33386  
 Conceptual heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility at Sandia, Albuquerque 15 p0318 A77-38209  
 Initial generator tests with revised ambient-temperature liquid-metal MHD facility 15 p0326 A77-39538  
 Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility 16 p0484 A77-49040  
 Georgia Tech 400 Kwth solar thermal test facility 16 p0498 A77-49158  
 Georgia Tech high temperature solar test facility 16 p0500 A77-49745  
 Development scenario for laser fusion [UCRL-76980] 14 p0216 N77-18575  
 InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 3: National solar demonstration program [COO-2688-76-6-VOL-3] 14 p0224 N77-19634  
 Performance and analysis of SOLARIS water-trickle solar collector [CONF-760821-9] 14 p0232 N77-20599  
 Brookhaven superconducting cable test facility [BNL-21780] 14 p0236 N77-21331  
 Photovoltaic system test facility electromagnetic interference measurements [NASA-TM-X-73640] 15 p0343 N77-22608  
 ERDA/Lewis research center photovoltaic systems test facility [NASA-TM-X-73641] 15 p0343 N77-22609  
 Development of the solar power central receiver concept [SAND-76-8677] 15 p0344 N77-22624  
 Planning and design of additional East Mesa Geothermal Test Facilities. Phase 1B, Volume 2: Procurement package [SAND/1140-1/2-VOL-2] 16 p0558 N77-33657

**TEST VEHICLES**  
 Baseline test data for the EVA electric vehicle --- low energy consumption automobiles 13 p0025 A77-12704

Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van [NASA-TM-X-73638] 14 p0236 N77-21549

**TETHERED BALLOONS**  
 The Tethered Balloon Current Generator - A space shuttle-tethered subsatellite for plasma studies and power generation 14 p0184 A77-26200  
 Utilization of wind energy for electrical power supplies to ESSOR stationary platforms --- tropospheric tethered balloon experiment 16 p0427 A77-45610

**TEXAS**  
 Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 N77-18562  
 Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization [CONF-760222-P4] 14 p0248 N77-21675  
 Proceedings of Second Geopressured Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3] 14 p0249 N77-21678  
 The phasing out of natural gas and oil for electric power generation, southwest power pool and Electric Reliability Council of Texas. Part 2: Technical and economic evaluation of various possible electric utility natural gas reduction programs, 1975 - 1990 [PB-263505/0] 15 p0356 N77-23617  
 Development of an assessment methodology for geopressurized zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in south Texas [COO-2687-5] 15 p0361 N77-24571

**TEXTILES**  
 Environmental considerations of selected energy conserving manufacturing process options. Volume 9: Textile industry report [PB-264275/9] 15 p0384 N77-26686

**THERMAL ABSORPTION**  
 Solar powered absorption cycle simulation using real and stochastic weather data [ASME PAPER 76-WA/SOL-6] 14 p0188 A77-26511  
 Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831  
 Thermal energy storage with saturated aqueous solutions 16 p0493 A77-49111  
 Optimization of absorption air-conditioning for solar energy applications [NASA-CR-150176] 14 p0210 N77-17560

**THERMAL BATTERIES**  
 Investigation of energy parameters of low-temperature ring thermopiles 16 p0409 A77-41902  
 Energy output and service life characteristics of high-voltage low-temperature thermopiles 16 p0442 A77-48517

**THERMAL BOUNDARY LAYER**  
 Laser anemometry in high velocity, high temperature boundary layers 15 p0288 A77-33708  
 Boundary layer measurements of temperature and electron number density profiles in a combustion MHD generator 15 p0288 A77-33710  
 A simplified technique for determining the boundary layer voltage loss in MHD generators 16 p0416 A77-42897

**THERMAL CONDUCTIVITY**  
 Results of some geothermal studies in Singbhum thrust belt, India 13 p0013 A77-11499  
 The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction 13 p0042 A77-12850  
 Structural heat conductivity of fiber metal wicks for heat pipes 13 p0050 A77-14326  
 A central solar energy utilization system 13 p0057 A77-16210



# SUBJECT INDEX

# THERMAL ENERGY

- Construction of two-dimensional steady-state solution of equations of a nonequilibrium magnetized plasma 13 p0065 A77-18130
- A zero g variable conductance heat pipe using bubble pump injection [AIAA PAPER 77-752] 15 p0311 A77-37265
- An analytical study of the maximal heat-carrying capacity of heat pipes 16 p0411 A77-42260
- On the construction of plane stationary solutions of equations for nonequilibrium magnetized plasma 16 p0420 A77-43705
- Investigation of the effective heat conductivity of metal-fiber wicks for low-temperature heat pipes 16 p0500 A77-49988
- Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application [PB-262372/6] 15 p0347 A77-22654
- THERMAL CONTROL COATINGS**
- Use of transparent heat reflecting coatings in solar energy converters 15 p0285 A77-33430
- Utilization of transparent heat-reflecting coatings in solar-energy converters 16 p0426 A77-45543
- Testing and fabrication of solar absorbers for the D5A' satellite [CHES-NT-37] 13 p0111 A77-13110
- THERMAL CYCLING TESTS**
- Progress on the testing of refractories for directly-fired MHD air heater service. II 15 p0328 A77-39544
- THERMAL DEGRADATION**
- Degradation of solar cell efficiency by sheet resistance 16 p0438 A77-47854
- THERMAL DIFFUSION**
- Diffuse thermal model of electrode erosion for MHD generators 13 p0049 A77-14319
- Study of a solar assisted diffusion separation process for isotopic mixtures 16 p0483 A77-49030
- THERMAL DIFFUSIVITY**
- Electrode phenomena in slagging MHD channels 15 p0330 A77-39561
- Some properties of coal slags of importance to MHD 15 p0330 A77-39563
- THERMAL DISSOCIATION**
- The calcium-iodine cycle for the thermochemical decomposition of water 15 p0275 A77-33340
- Progress in the Los Alamos Scientific Laboratory Program to develop thermochemical processes for hydrogen production 15 p0275 A77-33341
- Discovery of reaction sequences for thermochemical water splitting --- in hydrogen production cycles 15 p0275 A77-33343
- Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process 15 p0276 A77-33350
- Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- The Westinghouse Sulfur Cycle for the thermochemical decomposition of water 15 p0277 A77-33354
- Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle 15 p0277 A77-33356
- Modern technology electrolysis for power application 15 p0278 A77-33364
- Feasibility of hydrogen production by direct water splitting at high temperature 15 p0279 A77-33372
- Hydrogen energy - Its potential promises and problems 15 p0284 A77-33410
- ERDA's hydrogen programs 15 p0284 A77-33412
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution 15 p0284 A77-33415
- OPTIMO - A method for process evaluation applied to the thermochemical decomposition of water 15 p0320 A77-38526
- Hydrogen production from water utilizing solar heat at high temperatures 16 p0501 A77-50205
- An investigation of hydrogen production from water at high temperatures 14 p0240 A77-21607
- THERMAL EMISSION**
- Use of transparent heat reflecting coatings in solar energy converters 15 p0285 A77-33430
- Utilization of transparent heat-reflecting coatings in solar-energy converters 16 p0426 A77-45543
- Effectiveness of heat-emitting coatings with variable degree of blackness 13 p0111 A77-12893
- THERMAL ENERGY**
- A method of testing for rating solar collectors based on thermal performance 13 p0019 A77-12408
- Thermal energy storage applied to residential heating systems 13 p0027 A77-12729
- Storage in oil of off-peak thermal energy from large power stations 13 p0027 A77-12730
- Thermal energy storage for solar power plants 13 p0027 A77-12731
- Comparative performance of solar thermal power generation concepts 13 p0036 A77-12803
- Solar thermal electric power plants - Their performance characteristics and total social costs 13 p0037 A77-12804
- The role of simulation in the development of solar-thermal energy conversion systems 13 p0037 A77-12809
- Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812
- Development of a small radioisotopic heat source 13 p0042 A77-12852
- Thermal explosion of moving reacting fluids of variable viscosity 13 p0052 A77-14980
- Thermal energy storage for heating and air conditioning 13 p0057 A77-16206
- Application of solar energy in the high-temperature range 13 p0063 A77-17636
- Solar photothermal power generation 14 p0146 A77-21700
- Antiloss cell structures - Coupling with a selective surface --- solar collector surface properties 14 p0148 A77-21790
- Design considerations for heat recovery system for DD-963 class ship [ASME PAPER 77-GT-106] 14 p0197 A77-28616
- Energy considerations related to the acquisition, supply, and utilization of solar energy 14 p0203 A77-29572
- A comparison of solar photothermal coatings 14 p0204 A77-29584
- Solar-thermal energy systems 15 p0262 A77-31472
- Solar-thermal power systems 15 p0262 A77-31474
- Energy storage --- review 15 p0264 A77-31579
- Thermal accumulators --- latent heat storage system design 15 p0264 A77-31673
- Thermal energy storage --- in building elements, water and rock beds 15 p0264 A77-31698
- Energy from wastes 15 p0272 A77-33280
- Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344

## THERMAL EXPANSION

## SUBJECT INDEX

A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system 15 p0280 A77-33387

Conceptual heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility at Sandia, Albuquerque 15 p0318 A77-38209

Energy recovery by the incineration of solid waste - Development, present status and experiences in Germany 15 p0334 A77-39675

Solar generators - Utilization of solar energy for power-supply applications 15 p0336 A77-39980

Thermal storage for electric utilities [AIAA 77-1009] 16 p0403 A77-41556

Design considerations on a thermal energy storage Stirling engine automobile [SAE PAPER 770080] 16 p0424 A77-44558

Molten salt thermal energy storage for utility peaking loads 16 p0451 A77-48765

Investigation of metal fluoride thermal energy storage materials 16 p0451 A77-48767

Safety considerations for high temperature thermal energy storage in fluoride salts 16 p0451 A77-48768

Large-scale thermal storage in rock - Construction, utilization, and economics 16 p0451 A77-48769

Thermal energy storage 16 p0461 A77-48841

Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant 16 p0461 A77-48842

Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design 16 p0461 A77-48844

Solar thermal system requirements 16 p0481 A77-49017

Survey of the applications of solar thermal energy to industrial process heat 16 p0481 A77-49019

A central receiver solar system applicable to central power stations 16 p0483 A77-49036

Collector field design for a central receiver solar thermal power plant 16 p0484 A77-49039

Extension of the Hottel-Whillier-Bliss model to the analysis of combined photovoltaic/thermal flat plate collectors 16 p0486 A77-49057

High temperature thermal energy storage 16 p0491 A77-49099

Chemical methods of storing thermal energy 16 p0491 A77-49100

Survey of high temperature thermal energy storage [SAND-75-8063] 13 p0088 A77-10655

Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings [PB-254665/3] 13 p0091 A77-10689

Selected aspects of waste heat management: A state-of-the-art study [PB-255697/5] 13 p0100 A77-11563

Conference proceedings, Energy from the Oceans, Fact or Fantasy [PB-256093/6] 13 p0108 A77-12547

Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships [PB-255639/7] 13 p0109 A77-12552

Dual purpose nuclear power plants for military installations [AD-A026141] 13 p0132 A77-15521

Central receiver solar thermal power system, phase 1 [SAN/1110-76/T1] 14 p0216 A77-18570

Economic evaluation of mixture and pure fluid cycles in ocean thermal energy conversion systems [ORO-4918-8] 14 p0217 A77-18578

Ocean thermal energy conversion opportunities [BNWL-SA-5808] 14 p0217 A77-18581

Computer modeling of a regenerative solar-assisted Rankine power cycle 14 p0218 A77-19112

Storage of thermal energy in molten salts and metals [NASA-TT-F-17412] 14 p0220 A77-19574

Potential national benefits of geothermal electrical energy production from hydrothermal resources in the West [BNWL-SA-5798] 14 p0220 A77-19583

Technical and economic feasibility of thermal energy storage [COO-2558-1] 14 p0222 A77-19605

Energy resources alternatives competition [COO-2698-1] 14 p0224 A77-19635

Discovery of reaction sequences for thermochemical water splitting [AD-A029959] 14 p0228 A77-20191

Central receiver solar thermal system, phase 1, CPRL item 10 [SAN/1108-76/2] 14 p0231 A77-20591

Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 14 p0237 A77-21564

A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system 14 p0242 A77-21622

Thermal energy storage for building heating and cooling applications [ORNL-TM-5700] 15 p0344 A77-22617

Development of the solar power central receiver concept [SAND-76-8677] 15 p0344 A77-22624

Molten salt thermal energy storage systems: Salt selection [COO-2888-1] 15 p0365 A77-24609

United States special format report: Report of the Phoenix Corporation, city of Colorado Springs Solar Heating Project [SE-4578-76/1] 15 p0373 A77-25647

Survey of technology for storage of thermal energy in heat transfer salt [ORNL-TM-5682] 15 p0392 A77-27513

Nonbiological photochemical energy conversion, can it compete [SAND-76-5763] 15 p0393 A77-27541

Central receiver solar thermal power system, phase 1 [SAN/1110-76/2] 15 p0394 A77-27551

ERDA's central receiver solar thermal power system studies 16 p0526 A77-30279

NASA thermionic-conversion program [NASA-TM-X-73644] 16 p0535 A77-31612

Low-temperature thermal energy storage [ORNL-TM-5795] 16 p0536 A77-31631

Survey of the applications of solar thermal energy systems to industrial process heat. Volume 3: Solar thermal energy systems analysis and preliminary assessment of related nontechnical issues [TID-27348-VOL-3] 16 p0537 A77-31638

Survey of the applications of solar thermal energy systems to industrial process heat. Volume 2: Industrial process heat survey [TID-27348-VOL-2] 16 p0537 A77-31639

Low to high temperature energy conversion system [NASA-CASE-RPO-13510-1] 16 p0545 A77-32581

**THERMAL EXPANSION**

Development of a high efficiency thin silicon solar cell [NASA-CR-153905] 15 p0391 A77-27502

**THERMAL INSULATION**

Optimal thermal insulation as an investment-computational problem 13 p0009 A77-11268

Thermal evaluation of a house using a movable-insulation heating and cooling system 13 p0019 A77-12407

Multipurpose insulation system for a radioisotope fueled Mini-Brayton Heat Source Assembly 13 p0022 A77-12678

Practical aspects of solar heating - A review of materials use in solar heating applications 13 p0049 A77-13743

Energy savings by application of knowledge of building physics. I - Wall permeability and its significance for the atmospheric conditions in the building interior, the design and the thermal characteristics of windows, problems concerning the permeability of the joints 15 p0261 A77-31373

# SUBJECT INDEX

# THERMAL STABILITY

- Thermal energy management techniques in spacecraft design and their potential for terrestrial applications 16 p0439 A77-47969
- Experimental polyurethane foam roofing systems [AD-A031046] 14 p0210 N77-17255
- Practical reasons for investigating ion transport in high temperature insulating materials --- for energy conversion efficiency [CONV-760831-2] 14 p0227 N77-19935
- Transparent glass honeycomb structures for energy loss control --- for solar collectors [SAN/1084-75/1] 14 p0248 N77-21673
- THERMAL MAPPING**
- Thermographic mosaic of Yellowstone National Park p0001 A77-10121
- A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs 13 p0014 A77-11591
- The Los Alamos Scientific Laboratory Dry Hot Rock Geothermal Project /LASL Group Q-22/ 14 p0163 A77-23032
- Research and development of geothermal energy production in Hungary 14 p0163 A77-23034
- The flow of heat from the earth's interior 16 p0408 A77-41800
- Construction and interpretation of a digital inertia image --- of Pisgah Crater and Lavinia Lake in Southern California 16 p0421 A77-44464
- Computing residuals in geothermal research by I.R. scanning 16 p0431 A77-46768
- Telluric mapping over the Mesa Geothermal Anomaly, Imperial Valley, California [PB-262828/7] 15 p0355 N77-23593
- THERMAL POLLUTION**
- Predicting the rate of warming of rivers below hydroelectric installations 16 p0437 A77-47749
- Mathematical simulation and empirical determination of the aerochemical and thermal atmospheric pollution resulting from energy conversion processes [DLR-IP-553-75/1] 13 p0091 N77-10700
- Physical and biological aspects of thermal pollution in sea water --- forecasting electric power production in Italy [ISS-L-75/14] 13 p0109 N77-12560
- Assessment of the impact of proposed thermal effluent guidelines for the steam electric power industry [PB-255937/5] 13 p0110 N77-12587
- Atmospheric impacts of evaporative cooling systems [ANL-ES-53] 15 p0367 N77-24643
- Effects of thermal pollution on certain aquatic invertebrates [PB-263488/9] 15 p0368 N77-24673
- THERMAL PROTECTION**
- Thermal performance of the rotor of the MIT-EPRI 3 MVA superconducting alternator --- cryogenic cooling 14 p0144 A77-21384
- THERMAL RADIATION**
- A solar collector of glass 14 p0148 A77-21792
- THERMAL REACTORS**
- Uranium zirconium hydride reactor space power systems [IAP PAPER 76-256] 13 p0004 A77-10953
- Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification [SAE PAPER 770047] 16 p0424 A77-44557
- Effects of a thermal reactor on the energy efficiency of a turbocharged, stratified charge engine [AD-A026059] 13 p0128 N77-15409
- THERMAL RESISTANCE**
- Investigation of the thermophysical characteristics of low-temperature heat pipes with metal-fiber wicks 13 p0050 A77-14321
- Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361
- The NASA thermionic-conversion /TEC-ART/ program 16 p0438 A77-47960
- THERMAL RESOURCES**
- A cylindrical blackbody solar energy receiver 13 p0018 A77-12404
- Optimal control of flow in low temperature solar heat collectors 13 p0019 A77-12409
- Performance analysis of a cylindrical parabolic focusing collector and comparison with experimental results 13 p0019 A77-12410
- A forced circulation system for solar water heating 13 p0019 A77-12413
- Underground storage of off-peak power 13 p0027 A77-12728
- Industrial energy conservation through integration of thermal energy storage into process energy dynamics 13 p0028 A77-12733
- Seasonal storage of thermal energy in water in the underground --- reservoirs 13 p0028 A77-12734
- Geothermal energy in Hawaii - Hydrothermal systems 13 p0029 A77-12741
- Pressure drawdown and buildup analyses in geothermal reservoirs 13 p0030 A77-12753
- Geothermal powered heat pumps to produce process heat 13 p0030 A77-12754
- Direct applications of geothermal energy 13 p0030 A77-12755
- Extracting energy from hydraulically-fractured geothermal reservoirs 13 p0030 A77-12757
- Geothermal sources and their utilization 13 p0055 A77-15803
- Geothermal power - The 'sleeper' in the energy race 13 p0056 A77-15845
- A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems 13 p0058 A77-16306
- Problems related to operating thermal wells subject to scaling in Hungary 14 p0163 A77-23035
- Sun power: An introduction to the applications of solar energy --- Book 15 p0288 A77-33967
- Energy assessment and possibilities of remote heat supply 15 p0338 A77-40350
- THERMAL SHOCK**
- The French CNRS 1000 kW solar furnace - Description, performance characteristics, present utilization, and perspectives 15 p0262 A77-31473
- THERMAL SIMULATION**
- Determination of average ground reflectivity for solar collectors 14 p0181 A77-25903
- Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps [ASHE PAPER 76-WA/SOL-23] 14 p0190 A77-26528
- THERMAL STABILITY**
- Status of development and application of gas-stabilized heat-pipe radiators [DGLR PAPER 76-192] 13 p0060 A77-16557
- Exploring stability criteria of solar ponds [ASHE PAPER 76-WA/HT-62] 14 p0187 A77-26489
- Jet fuel quality considerations 15 p0272 A77-33273
- Development of a low temperature phase change material package --- for spacecraft thermal control [AIAA PAPER 77-762] 15 p0325 A77-39514
- Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel 15 p0328 A77-39550
- Solar pond stability experiments 16 p0482 A77-49028
- Thermal stability of some aircraft turbine fuels derived from oil shale and coal [NASA-TN-X-3551] 15 p0370 N77-25345
- Thermal stability improvement of diesel fuels of isopropyloctadecylamine [NASA-TT-P-17300] 15 p0388 N77-27242

# THERMAL STRESSES

# SUBJECT INDEX

Effect of nitrogenous bases on the thermal stability of jet fuels  
[NASA-TN-75131] 15 p0388 N77-27243

**THERMAL STRESSES**  
Calculation of thermal stresses in ceramic elements of the refractory channel walls of a magnetohydrodynamic generator 15 p0263 A77-31540  
Laboratory investigation of high temperature alloy failure mechanisms 15 p0271 A77-32608

**THERMALIZATION (ENERGY ABSORPTION)**  
Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids 16 p0411 A77-42160

**THERMIONIC CONVERTERS**  
Advanced thermionic converter development 13 p0043 A77-12862  
NASA thermionic-conversion program 13 p0043 A77-12863  
Thermionic energy conversion technology - Present and future [AIAA PAPER 77-500] 14 p0173 A77-23918  
Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765  
Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421  
The NASA thermionic-conversion /TEC-ART/ program 16 p0438 A77-47960  
Environmental assessment of advanced energy conversion technologies 16 p0452 A77-48778  
NASA Thermionic-Conversion program 16 p0466 A77-48886  
Thermionic converter studies at Thermo Electron 16 p0466 A77-48887  
Thermionic converter performance with oxide collectors 16 p0466 A77-48888  
Status of research on advanced thermionic converters 16 p0466 A77-48889  
Low arc drop hybrid mode thermionic converter 16 p0466 A77-48890  
Solar thermionic power systems for terrestrial applications 16 p0466 A77-48893  
Increased central station power plant efficiency with a thermionic topping system 16 p0467 A77-48894  
Evaluation of MHD-thermionic-steam cycles 16 p0467 A77-48895  
Comparative evaluation of technical and economic indices for MHD and thermionic toppers for steam turbine facilities 16 p0469 A77-48909  
NASA thermionic-conversion program [NASA-TN-X-73644] 16 p0535 N77-31612  
High efficiency thermionic converter studies [NASA-CR-135263] 16 p0546 N77-32592

**THERMIONIC DIODES**  
An economic analysis of thermic diode solar panels [ASME PAPER 76-WA/SOL-7] 14 p0188 A77-26512

**THERMIONIC EMISSION**  
Thermionic emission characteristics of seeded coal slags 14 p0140 A77-21229

**THERMIONIC POWER GENERATION**  
Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies 13 p0018 A77-12361  
Thermionic topping for central station power plants 13 p0034 A77-12787  
Thermionic topping of a steam power plant 13 p0034 A77-12789  
Heat pipe nuclear reactor for space power 13 p0036 A77-12797  
ERDA's Bicentennial Thermionic Research and Technology Program 13 p0042 A77-12861  
NASA thermionic-conversion program 13 p0043 A77-12863  
Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312

Thermionic energy conversion technology - Present and future [AIAA PAPER 77-500] 14 p0173 A77-23918  
Automatic optimization of operating modes in thermionic electrical power generators [IAF PAPER 77-142] 16 p0507 A77-51445

**THERMOCHEMICAL PROPERTIES**  
Experimental demonstration of an iron chloride thermochemical cycle for hydrogen production 13 p0032 A77-12772  
Test and evaluation of the Navy half-watt RTG --- Radioisotope Thermoelectric Generator 13 p0042 A77-12853  
Hydrogen production using nuclear heat 13 p0057 A77-16211  
Hydrogen production from water by means of chemical cycles 13 p0058 A77-16471  
Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal 16 p0442 A77-48489  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 16 p0457 A77-48812  
Development progress on the Sulfur Cycle Water Decomposition System --- for hydrogen production 16 p0457 A77-48813  
Recent developments in the engineering and chemistry of the ZnSe thermochemical hydrogen cycle 16 p0457 A77-48815  
Irreversibilities in thermochemical cycles for hydrogen production by water decomposition 16 p0457 A77-48816  
Chemical methods of storing thermal energy 16 p0491 A77-49100  
Effectiveness of heat-emitting coatings with variable degree of blackness 13 p0111 A77-12893  
Discovery of reaction sequences for thermochemical water splitting [AD-A029959] 14 p0228 A77-20191  
Preliminary assessment of economics of hydrogen production from Lawrence Livermore Laboratory ZnSe thermochemical cycle [UCRL-13711] 16 p0536 A77-31626

**THERMOCHEMISTRY**  
Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737  
Thermochemical energy storage systems 13 p0028 A77-12738  
Nuclear driven water decomposition plant for hydrogen production 13 p0035 A77-12791  
Stage efficiency in the analysis of thermochemical water decomposition processes 13 p0047 A77-13538  
Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541  
Thermal alteration of young kerogen in relation to petroleum genesis 13 p0053 A77-15044  
Thermo-chemical production of hydrogen 13 p0075 A77-19074  
Entropy production, efficiency, and economy in the case of the thermochemical production of synthetic fuels - The sulfuric acid-hybrid process for thermochemical water decomposition 14 p0145 A77-21544  
Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593  
Progress in the Los Alamos Scientific Laboratory Program to develop thermochemical processes for hydrogen production 15 p0275 A77-33341  
Discovery of reaction sequences for thermochemical water splitting --- in hydrogen production cycles 15 p0275 A77-33343  
A thermochemical data bank for cycle analysis --- water decomposition for hydrogen production 15 p0276 A77-33346  
The compatibility of containment materials for thermochemical hydrogen production 15 p0276 A77-33347

# SUBJECT INDEX

# THERMODYNAMIC CYCLES

- Laboratory investigations on thermochemical hydrogen production 15 p0276 A77-33348
- Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- The Westinghouse Sulfur Cycle for the thermochemical decomposition of water 15 p0277 A77-33354
- Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle 15 p0277 A77-33356
- Hydrogen vehicular fuel storage as a step in a water splitting cycle 15 p0280 A77-33381
- OPTIMO - A method for process evaluation applied to the thermochemical decomposition of water 15 p0320 A77-38526
- Thermochemical hydrogen production via a cycle using barium and sulfur - Reaction between barium sulfide and water 15 p0321 A77-38529
- Coal particle integrity in high-temperature solvents, with and without agitation 16 p0401 A77-41317
- Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [DLR-FB-76-32] 13 p0114 A77-13541
- Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families 14 p0238 A77-21572
- Thermodynamics of thermochemical water decomposition processes 14 p0238 A77-21574
- Discovery of reaction sequences for thermochemical water splitting 14 p0238 A77-21575
- A thermochemical data bank for cycle analysis 14 p0238 A77-21578
- Laboratory investigations on thermochemical hydrogen production 14 p0238 A77-21580
- The Westinghouse sulfur cycle for the thermochemical decomposition of water 14 p0238 A77-21587
- Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle 14 p0238 A77-21589
- Production of chemical energy carriers by non-expandable energy sources --- solar energy electrolysis, photolysis, and thermochemical cycles [ESA-TT-338] 14 p0251 A77-21701
- Technoeconomic analysis of large scale thermonuclear production of hydrogen [EPRI-EH-287] 16 p0532 A77-31336
- Hydrogen generation process [FE-2262-3] 16 p0533 A77-31337
- THERMOCOUPLES**
- Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 15 p0283 A77-33407
- On power-generating thermojunctions with radial flow of current --- for solar energy conversion 16 p0500 A77-50202
- Branched thermocouple circuits in underground coal gasification experiments [SAND-75-5910] 13 p0130 A77-15504
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 14 p0245 A77-21645
- THERMODYNAMIC COUPLING**
- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269
- The concept of 'nuclear hydrogen production' and progress of work in the Nuclear Research Center Juelich 15 p0273 A77-33348
- THERMODYNAMIC CYCLES**
- Uranium zirconium hydride reactor space power systems [IAP PAPER 76-256] 13 p0004 A77-10953
- The use of program GEOTHM to design and optimize geothermal power cycles 13 p0031 A77-14758
- Experimental demonstration of an iron chloride thermochemical cycle for hydrogen production 13 p0032 A77-12772
- Isotope heat source for dynamic power systems 13 p0036 A77-14796
- A hydride compressor 13 p0046 A77-13336
- Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541
- Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up --- utilizing Stirling engine 13 p0051 A77-14580
- Investigation of two-phase liquid-metal magnetohydrodynamic power systems 13 p0057 A77-16212
- Analysis of parameters and characteristics of a bypass turbojet engine operating in a cycle with stepwise heat removal 13 p0063 A77-17765
- Use of solar water-heating installations in the combined cycle of a thermal electric power plant 14 p0152 A77-21825
- The gas turbine --- French book 14 p0162 A77-22921
- New energy systems - Associated thermodynamic cycles --- French book 14 p0162 A77-22924
- Absorption cycles for air-cooled solar air conditioning 14 p0168 A77-23447
- Possible applications of geothermal energy in France 14 p0175 A77-24208
- Power production from high salinity geothermal waters 14 p0183 A77-26090
- Implications of utilizing synthetic fuels in combined cycles 14 p0193 A77-27301
- Optimum solar collector operation for maximizing cycle work output 15 p0255 A77-30313
- Discovery of reaction sequences for thermochemical water splitting --- in hydrogen production cycles 15 p0275 A77-33343
- Balance and optimization procedure for thermochemical cycles for hydrogen production 15 p0276 A77-33345
- A thermochemical data bank for cycle analysis --- water decomposition for hydrogen production 15 p0276 A77-33346
- Laboratory investigations on thermochemical hydrogen production 15 p0276 A77-33348
- A thermodynamic analysis of HTCSOS, a hydrogen conversion and storage system 15 p0280 A77-33387
- Combined cycles in single circuit solar refrigerating systems 15 p0286 A77-33434
- Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant --- utilizing Stirling engine 15 p0291 A77-34974
- 10 design principles for air-to-air heat pumps 16 p0408 A77-41824
- Conjugate cycles of single-loop solar power and refrigeration plants 16 p0427 A77-45547
- A ceramic heat exchanger for exhaust fired gas turbine power cycles 16 p0445 A77-48719
- Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723

- Coal gasification combined-cycle pilot plant system analysis 16 p0446 A77-48724
- Free-piston heat pumps --- using various thermodynamic cycles 16 p0449 A77-48748
- Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California --- in geothermal resources exploitation 16 p0455 A77-48801
- The use of mixture working fluids in geothermal binary power cycles 16 p0455 A77-48802
- Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804
- Evaluation of MHD-thermionic-steam cycles 16 p0467 A77-48895
- Parametric study of a dynamic solar powered absorption cycle 16 p0475 A77-48961
- Geothermal energy for electrical and nonelectrical applications [LA-OR-76-418] 13 p0123 N77-14601
- Ocean Thermal Energy Conversion (OTEC) 16 p0526 N77-30278
- THERMODYNAMIC EFFICIENCY**
- Making electricity from moderate temperature fluids --- geothermal sources 13 p0002 A77-10649
- Total energy systems --- electric power generation with heat recovery 13 p0006 A77-11042
- Thermal energy storage applied to residential heating systems 13 p0027 A77-12729
- PULSAR, an unconventional topping stage --- MHD generation with metallic armature produced magnetic flux compression 13 p0034 A77-12788
- KIPS - Kilowatt Isotope Power System --- for use in satellites 13 p0041 A77-12837
- Air transportation and fuel consumption 13 p0051 A77-14563
- A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems 13 p0058 A77-16306
- Energy and environmental considerations in extending heat pump applications 13 p0062 A77-17058
- Pressure ratio optimization criteria in aircraft turbojet-engines design 13 p0062 A77-17258
- Thin film solar acceptors 13 p0072 A77-19053
- Temperature optimization for power production of infinite heat transfer solar absorbers 13 p0073 A77-19055
- Solar thermal power generation 13 p0077 A77-19095
- Problems of analysis of the power characteristic of a high capacity magnetohydrodynamic power station 14 p0143 A77-21270
- Thermodynamic conversion systems as applied to solar energy 14 p0148 A77-21783
- Interaction between the solar mirror field and the thermodynamic system of a turning solar power plant 14 p0151 A77-21824
- Design and testing of planar solar collectors 14 p0164 A77-23298
- Relationship between heat source temperature, heat sink temperature and coefficient of performance for solar-powered absorption air conditioners 14 p0168 A77-23486
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0171 A77-23718
- Problems of heat and mass transfer in geothermal energetics 14 p0174 A77-24202
- Heat exchangers for the Ocean Thermal Energy Power Plant 14 p0176 A77-24219
- Optimal overall efficiency for a solar radiation collector utilizing a two fluid Rankine Cycle to generate electrical power 14 p0182 A77-26056
- Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASME PAPER 76-WA/HT-10] 14 p0186 A77-26470
- Performance evaluation on the Owens-Illinois Sunpack solar energy collector [ASME PAPER 76-WA/SOL-16] 14 p0189 A77-26521
- Analysis of thermal performance of 'Solaris' water-trickle solar collector [ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526
- Thermal efficiency of geothermal power 14 p0205 A77-29788
- Design application of the Hottel-Whillier-Bliss equation --- for flat-plate solar collector heat testing 15 p0255 A77-30309
- Production of electricity through thermodynamic conversion of solar energy - 10 MWe project 15 p0270 A77-32591
- Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593
- The calcium-iodine cycle for the thermochemical decomposition of water 15 p0275 A77-33340
- Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344
- Design of closed-cycle MHD generator with nonequilibrium ionization and system 15 p0303 A77-36381
- Part-load performance and voltage-current characteristics of a base load MHD generator 15 p0332 A77-39573
- MHD systems with low cooling requirements 15 p0332 A77-39575
- Technical and economic aspects of industrial power-heat coupling. I 15 p0334 A77-39674
- Biphase turbines for diesel bottoming --- waste heat recovery 16 p0449 A77-48755
- A comparison of three working fluids for the design of geothermal power plants 16 p0455 A77-48800
- Geothermal power cycle analysis 16 p0455 A77-48803
- Development status - Binary Rankine cycle waste heat recovery system 16 p0459 A77-48828
- Thermal energy storage 16 p0461 A77-48841
- Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant 16 p0461 A77-48842
- 1 MWh solar cavity steam generator solar test program 16 p0461 A77-48846
- A new ported constant volume external heat supply regenerative cycle --- for Stirling cycle engines 16 p0465 A77-48885
- Fermi function model absorption profile for solar-thermal conversion 16 p0483 A77-49035
- Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161
- Performance correlations of five solar collectors tested simultaneously outdoors 16 p0498 A77-49162
- An experimental investigation with artificial sunlight of a solar hot-water heater 16 p0498 A77-49163
- Thermal efficiency of solid electrolyte fuel cells with mixed conduction 16 p0500 A77-50199
- Performance correlations of five solar collectors tested simultaneously outdoors [NASA-TM-X-73546] 13 p0128 N77-15487

- Hydrogen energy conversion --- for thermodynamic efficiency and cost effectiveness [AD-1030370] 14 p0218 N77-18601
- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 14 p0240 N77-21608
- The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0243 N77-21627
- Two investigations of flat-plate solar collector performance 15 p0355 N77-23598
- Assessment of the potential for energy conservation through improved industrial boiler efficiency, volume 1 [PB-262576/2] 15 p0374 N77-25665
- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 N77-31207
- Projected thermodynamic efficiencies of fusion power plants [BNWL-2017] 16 p0550 N77-32958
- Transpiration heat transfer in thermal energy storage devices [PB-267281/4] 16 p0554 N77-33616
- THERMODYNAMIC EQUILIBRIUM**
- Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products 15 p0269 A77-32506
- THERMODYNAMIC PROPERTIES**
- Evolution of thermal traction - From the diesel engine to the gas turbine 13 p0004 A77-10976
- Some useful relationships between the physical and thermodynamic properties of metal hydrides 13 p0033 A77-12776
- Geothermal energy as a source of electric power: Thermodynamic and economic design criteria --- Book 13 p0060 A77-16623
- Study and materialization of a selective surface designed for direct thermal conversion of solar energy - Application to medium temperature range 13 p0069 A77-18496
- Thermostatics and thermokinetics of a flat plate solar collector with constant heat capacity 13 p0073 A77-19057
- Optical and thermal properties of Compound Parabolic Concentrators 14 p0157 A77-22641
- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374
- Procedure for calculating thermocompressor thermodynamical parameters --- for solar energy conversion 16 p0442 A77-48519
- Thermal properties of subsurface rocks in the Ukraine 16 p0443 A77-48647
- High temperature thermal energy storage system, Na<sub>2</sub>SO<sub>4</sub> + SO<sub>3</sub> reversibly yields Na<sub>2</sub>SO<sub>3</sub> 16 p0450 A77-48764
- Hydrogen absorption in Ti<sub>3</sub>Al 16 p0506 A77-51372
- A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system 14 p0242 N77-21622
- Automotive hydride tank design 14 p0244 N77-21637
- Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber [SAND-76-8663] 14 p0248 N77-21674
- Analysis of thermal performance of Solaris water-trickle solar collector [CONF-761107-17] 15 p0382 N77-26668
- THERMODYNAMICS**
- HYCSOS - A solar heating, cooling and energy conversion system based on metal hydrides 13 p0029 A77-12740
- The analysis of the temperature regimes of the operation of a gas-regulated heat pipe 13 p0064 A77-17924
- Thermodynamic constraints, effective temperatures and solar cells 14 p0147 A77-21779
- Modern technology electrolysis for power application 15 p0278 A77-33364
- Effective conversion processes between thermal and chemical energies: Thermodynamic study of multistep water decomposition processes 14 p0238 N77-21576
- A thermochemical data bank for cycle analysis 14 p0238 N77-21578
- Temperature dependence of the photovoltaic performance of Si cells under blue, white, and near-bandgap irradiation [UCBL-76203] 15 p0381 N77-26652
- Thermodynamic analysis of an oil reclamation process [PB-268524/6] 16 p0548 N77-32614
- THERMOELECTRIC COOLING**
- Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle [AD-A026321] 13 p0124 N77-14607
- THERMOELECTRIC GENERATORS**
- SNAP 19 Viking RTG mission performance 13 p0041 A77-12840
- Development of a small radioisotopic heat source 13 p0042 A77-12852
- Test and evaluation of the Navy half-watt RTG --- Radioisotope Thermoelectric Generator 13 p0042 A77-12853
- Spherical radioisotope thermoelectric generators - An approach to high specific power devices 13 p0042 A77-12857
- Optimization of the geometry of switching buses for thermoelements in thermoelectric generators 13 p0052 A77-14951
- Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324
- Potentialities of electric energy production by means of thermoelectric generators 14 p0154 A77-21847
- Principal stages in the development of thermoelectric power in the USSR 14 p0156 A77-22123
- The selenide isotope generators [AIAA PAPER 77-498] 14 p0173 A77-23916
- Generalized analysis of thermoelectric device configurations 14 p0177 A77-24572
- Radioisotope power sources in the terrestrial and marine environment 14 p0196 A77-28170
- Energy-direct-conversion in solar technology 14 p0203 A77-29574
- Optimal unit commitment --- electric power system operating mode for cost reduction 15 p0260 A77-30812
- Catalytic action of combustion-product deposits in the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the combustion chambers and exhaust channels of thermoelectric plants 16 p0420 A77-44179
- Tests and evaluation of multihundred watt thermoelectric generators at JPL 16 p0462 A77-48854
- An assessment of the materials needs for a Kr-85 fuel capsule 16 p0462 A77-48855
- Terrestrial RTG designs featuring disc-shaped thermoelectric modules 16 p0462 A77-48856
- Design of a spherical RTG --- Radioisotope Thermoelectric Generators 16 p0462 A77-48857
- Assessment of the socio-economic and environmental aspects of the central receiver power plants 16 p0494 A77-49122
- International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings 16 p0500 A77-49753
- Analysis of ceramic materials for impact members in isotopic heat sources [BNI-X-670] 14 p0210 N77-17246
- Experimental screening of carbon-base materials for impact members in isotopic heat sources [BNI-X-673] 15 p0396 N77-27901

## THERMOELECTRIC MATERIALS

- Thermoelectric power of pseudoternary solid solutions 13 p0014 A77-11917
- Transport theory of 3M high-performance thermoelectric materials 13 p0042 A77-12848
- The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction 13 p0042 A77-12850
- Investigation of energy parameters of low-temperature ring thermopiles 16 p0409 A77-41902
- Solar energy utilization, solid state science, and a high efficiency amorphous-silicon absorber 16 p0487 A77-49065
- International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings 16 p0500 A77-49753
- THERMOELECTRIC POWER GENERATION**
- Power production from high temperature geothermal waters 13 p0030 A77-12751
- Transport theory of 3M high-performance thermoelectric materials 13 p0042 A77-12848
- The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction 13 p0042 A77-12850
- The low cost high performance generator /LCHPG/ --- space Radioisotope Thermoelectric Generators 13 p0042 A77-12855
- Geothermal energy as a source of electric power: Thermodynamic and economic design criteria --- Book 13 p0060 A77-16623
- Problems relating to heat storage --- at solar thermal power plant 14 p0152 A77-21826
- The solar tower as a source of thermal electric energy 14 p0152 A77-21831
- Thermoelectric conversion of solar energy by means of refractory B14Si compounds 14 p0154 A77-21848
- Theoretical and experimental validation of new sources of electrical energy 14 p0176 A77-24457
- Optical and thermal performance analysis of three line focus collectors [ASME PAPER 76-WA/HT-15] 14 p0186 A77-26475
- Description of thermal storage sub-system designs for ERDA's 10-MWe Solar Central Receiver Pilot Plant [ASME PAPER 76-WA/HT-68] 14 p0187 A77-26491
- Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy 15 p0274 A77-33334
- Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 15 p0274 A77-33335
- Investigation of energy parameters of low-temperature ring thermopiles 16 p0409 A77-41902
- International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings 16 p0500 A77-49753
- On power-generating thermojunctions with radial flow of current --- for solar energy conversion 16 p0500 A77-50202
- Pumped storage optimization in generation systems 16 p0506 A77-51284
- Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle [AD-A026321] 13 p0124 A77-14607
- THERMOHYDRAULICS**
- Submarine geothermal resources 13 p0010 A77-11322
- Geothermal powered heat pumps to produce process heat 13 p0030 A77-12754

- Transient behavior of solid sensible heat thermal storage units for solar energy systems 13 p0057 A77-16208
- A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems 13 p0058 A77-16306
- Thermal convection of water in a porous medium - Effects of temperature- and pressure-dependent thermodynamic and transport properties --- for non-Boussinesq geothermal layers 14 p0145 A77-21546
- Flow in geothermal hot water wells 14 p0163 A77-23037
- Interaction of hot water reservoirs and deep wells 14 p0163 A77-23038
- Ground water as energy carrier 15 p0302 A77-36347
- The question of the utilization of geothermal energy in dry rocks /dry walls/ 15 p0303 A77-36348
- Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361
- THERMONUCLEAR EXPLOSIONS**
- PACER - A practical fusion power concept 13 p0035 A77-12793
- Future space experiments with levitated capacitor for thermonuclear microexplosions [IAP PAPER 77-ST-11] 16 p0508 A77-51575
- THERMONUCLEAR POWER GENERATION**
- Prospects of generating power with laser-driven fusion 13 p0002 A77-10634
- A conceptual design study of closed Brayton cycle gas turbines for fusion power generation 13 p0022 A77-12676
- World survey of major facilities in controlled fusion research --- Book 13 p0067 A77-18264
- Overview of the ERDA fusion power program 13 p0068 A77-18446
- Overview of energy research and development administration inertial confinement fusion program 14 p0146 A77-21744
- Hydrodynamics and compression of a laser irradiated target --- fusion energy requirements 14 p0146 A77-21745
- Review of the conceptual design of a doublet fusion experimental power reactor [ASME PAPER 76-WA/NE-9] 14 p0188 A77-26494
- Parametric studies of applications of controlled thermonuclear reactor fusion energy for food production 14 p0194 A77-27356
- Thermonuclear fusion power 15 p0296 A77-35920
- Adapting the experience of DOD/Industry to developing fusion power reactors [AIAA 77-1019] 16 p0404 A77-41561
- Cryogenic instrumentation needs in the controlled thermonuclear research program [CONF-761007-1] 14 p0219 A77-19406
- Enhanced energy utilization from a controlled thermonuclear fusion reactor [PB-260653/1] 14 p0234 A77-20879
- Technology assessment of laser-fusion power production [LA-UR-76-2060] 15 p0351 A77-22975
- Environmental cost/benefit analysis for fusion power plants [BNWL-2028] 16 p0549 A77-32893
- Power loss problems in EXTRAP coil systems [TRITA-PFU-77-02] 16 p0549 A77-32910
- THERMONUCLEAR REACTIONS**
- Ignition of a pulsed thermonuclear reaction by high-current ion beams 14 p0164 A77-23106
- Details of hydrogen-burning thermonuclear reactions 14 p0168 A77-23457
- Fusion products detection system in Mignacell II 16 p0436 A77-4363
- THERMOPHYSICAL PROPERTIES**
- Characteristic equations of unconcentrated flat solar cell panels 13 p0052 A77-14929
- Fundamental studies on heat storage of solar energy 16 p0423 A77-44490



- Development and characterization of materials for open cycle MHD [BNWL-2004-3] 16 p0541 A77-31969
- THERMOPILES**
- Accelerated response of thermopile pyranometers 13 p0019 A77-12405
- Generalized analysis of thermoelectric device configurations 14 p0177 A77-24572
- Energy output and service life characteristics of high-voltage low-temperature thermopiles 16 p0442 A77-48517
- THERMOPLASTIC RESINS**
- Plastics in systems of solar technology - A survey 14 p0197 A77-28677
- THERMOREGULATION**
- Optimal control of flow in low temperature solar heat collectors 13 p0019 A77-12409
- THERMOSPHERE**
- Energetics of the midlatitude thermosphere 13 p0012 A77-11492
- THETA PINCH**
- Review of toroidal theta-pinch theory 16 p0427 A77-45628
- Energy storage and transfer with homopolar machine for a linear theta-pinch hybrid reactor [LA-6174] 14 p0214 A77-17892
- Cost estimation for a theta-pinch reactor [ANL-CTR-TM-40] 16 p0549 A77-32888
- THIN FILMS**
- CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica substrates 13 p0007 A77-11110
- Thin film solar acceptors 13 p0072 A77-19053
- A sulfurization process for the preparation of photovoltaic Cu<sub>x</sub>/S and CuInS<sub>2</sub> thin films 13 p0076 A77-19087
- Ceramic thin film CdTe solar cell 14 p0135 A77-19635
- Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells 14 p0147 A77-21781
- Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions 14 p0149 A77-21801
- Optimal parameters for solar cell films 14 p0150 A77-21805
- Calculation of the efficiency of a heterojunction solar cell 14 p0151 A77-21821
- Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions 14 p0162 A77-22978
- Particulate nature of solar absorbing films - Gold black 14 p0163 A77-22982
- Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell 15 p0258 A77-30721
- Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723
- Fabrication and characterization of thin-film silicon solar cells on alumina ceramic 15 p0258 A77-30732
- InP-CdS solar cells 15 p0259 A77-30740
- Thermally induced migration of hydrocarbon oil 15 p0268 A77-32375
- A minority carrier MIS solar cell 15 p0288 A77-33799
- Thin films in energy systems --- for energy conserving structural materials 15 p0306 A77-36673
- Heat mirrored solar energy receivers [AIAA PAPER 77-728] 15 p0324 A77-39506
- CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567
- Solar cells for terrestrial applications 16 p0485 A77-49050
- CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications 16 p0486 A77-49059
- CuInSe<sub>2</sub>/CdS thin film solar cells 16 p0486 A77-49062
- MIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective coating 16 p0499 A77-49494
- Thin film solar cells for terrestrial applications [PB-255606/6] 13 p0109 A77-12553
- The optical properties of chromium oxide films and the high temperature stabilization of silver films for photothermal solar energy conversion 13 p0128 A77-15484
- Investigation of low cost solar cells based on Cu<sub>2</sub>O [PB-258583/4] 14 p0217 A77-18582
- Investigation of low cost solar cells based on Cu<sub>2</sub>O [PB-258746/7] 14 p0217 A77-18583
- Silicon thin film crystallization and solar cell fabrication [PB-261715/7] 15 p0348 A77-22670
- Cadmium stannate selective optical films for solar energy applications [PB-261850/2] 15 p0348 A77-22672
- Ternary compound thin film solar cells [PB-262536/6] 15 p0374 A77-25662
- Ternary compound thin film solar cells - 1 [PB-265003/4] 15 p0395 A77-27561
- Investigation of high temperature performance of thin film, solar-thermal energy converters [PB-265554/6] 16 p0516 A77-28613
- Thin film solar cells for terrestrial applications [PB-265983/7] 16 p0523 A77-29635
- THIN PLATES**
- Research, development and pilot production of high output thin silicon solar cells [NASA-CR-149858] 14 p0219 A77-19573
- THORIUM**
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California [UCRL-52180] 16 p0536 A77-31628
- THREE DIMENSIONAL FLOW**
- Consideration of three-dimensional effects in MHD power generators 14 p0142 A77-21261
- Three dimensional current distribution in diagonal conducting wall channels 15 p0329 A77-39556
- A consideration of some three-dimensional effects in MHD channel 15 p0330 A77-39560
- THROTTLING**
- Fuel efficiency improvement in rail freight transportation: Multiple unit throttle control to conserve fuel [PB-262470/8] 15 p0366 A77-24629
- THRUST AUGMENTATION**
- Development of a small, low cost turbojet engine with thrust augmentation --- for RPV 16 p0434 A77-47347
- THRUST CONTROL**
- Solar array maximum power tracking with closed-loop control of a 30-centimeter ion thruster [NASA-TM-X-73643] 15 p0376 A77-26222
- THRUST MEASUREMENT**
- Aerodynamics of the Darrieus rotor 13 p0050 A77-14559
- THRUST VECTOR CONTROL**
- UK, T5 ion engine thrust vector control considerations [AIAA PAPER 76-1064] 13 p0045 A77-13030
- THYATRONs**
- Repetitive series Interrupter II [AD-A035267] 15 p0371 A77-25447
- THYRISTORS**
- Effect of components on converters --- solar cell array transistor and thyristor performance 14 p0153 A77-21841
- TIDAL WAVES**
- The atmosphere and the oceans as energy sources 13 p0005 A77-11036
- Hydrodynamic basis of wave-energy converters of channel form 15 p0267 A77-32211
- TIDE POWERED GENERATORS**
- Harnessing the ocean waves, swells and tides 14 p0183 A77-26091
- Energy from the oceans - Requirements and capabilities 15 p0272 A77-33141
- Utilizing alternative energy sources in France 15 p0296 A77-35923

- Tidal power generation in India 15 p0310 A77-36988
- Sea water - The energy elixir --- ocean thermal, tide and wave energy conversion 15 p0320 A77-38446
- Progress of feasibility reassessment of exploiting Fundy tidal energy 16 p0439 A77-47971
- TIDEPOWER**
- Predicting changes in tidal regime - The open boundary problem --- for tidepower generation 14 p0199 A77-29076
- The oceans as a source of electricity 16 p0412 A77-42401
- TIME LAG**
- Design of a tracking system for a solar-energy installation 13 p0015 A77-11919
- TIME MEASUREMENT**
- Advanced fuel fusion experimentation with Migma cells II and III - Orbit diagnostics and lifetime measurements 16 p0436 A77-47362
- TIN ALLOYS**
- Power transmission project [BNL-22202] 16 p0551 A77-33426
- TIN OXIDES**
- Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells 15 p0259 A77-30736
- TITANIUM**
- Evaluation of potassium titanate as a component of alkaline fuel cell matrices [NASA-TN-D-8341] 13 p0094 A77-11175
- Physical metallurgy of FeTi-hydride and its behavior in a hydrogen storage container 14 p0242 A77-21620
- TITANIUM ALLOYS**
- Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777
- Hydrogen storage via iron-titanium for a 26 MW/e/ peaking electric plant 13 p0048 A77-13543
- Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems 13 p0064 A77-18019
- Titanium alloy hydrides - Their properties and applications 15 p0280 A77-33385
- Hydrogen absorption in Ti3Al 16 p0506 A77-51372
- TITANIUM COMPOUNDS**
- Ambient temperature electric vehicle batteries based on lithium and titanium disulfide 13 p0025 A77-12706
- The behavior of iron titanium hydride test beds - Long-term effects, heat transfer and modeling 15 p0280 A77-33386
- The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling 14 p0242 A77-21621
- TITANIUM NITRIDES**
- Spectral reflectance of TiN/x/ and ZrN/x/ films as selective solar absorbers 16 p0423 A77-44492
- TITANIUM OXIDES**
- Near-uv photon efficiency in a TiO<sub>2</sub> electrode - Application to hydrogen production from solar energy 13 p0015 A77-11947
- Investigation of a TiO<sub>2</sub>/electrolyte solar cell and the photocatalytic water decomposition 13 p0077 A77-19094
- TOKAMAK FUSION REACTORS**
- A conceptual design study of closed Brayton cycle gas turbines for fusion power generation 13 p0022 A77-12676
- Superconducting induction coil for a doublet Tokamak experimental fusion power reactor 14 p0144 A77-21376
- Review on the IAEA workshop on large fusion Tokamak projects 14 p0146 A77-21737
- The current state and prospects for development of controlled thermonuclear fusion 14 p0157 A77-22537
- Tokamak experimental power reactor [ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- State of the art of controlled fusion 14 p0194 A77-27722
- Determination of the non-equilibrium MHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor 15 p0326 A77-39537
- Nuclear fusion - Focus on Tokamak** 16 p0407 A77-41645
- Minor radius compression experiments --- for ohmic heating efficiency improvement in Tokamaks 16 p0407 A77-41683
- Heating of the Frascati Tokamak by means of quasi perpendicular neutral injection 16 p0407 A77-41706
- Additional heating and refuelling for the ASDEX divertor Tokamak 16 p0407 A77-41710
- Plasma heating systems planned for the Argonne experimental power reactor 16 p0407 A77-41712
- Additional heating in JET --- plasma energy confinement in Joint European Tokamaks 16 p0407 A77-41718
- Studies of deuterium-fueled Tokamak reactors 16 p0435 A77-47357
- Characteristics of a first generation commercial fusion power plant [GA-A-13661] 13 p0093 A77-10891
- Neutral beam energy and power requirements for the next generation of tokamaks [ERDA-76-77] 14 p0213 A77-17883
- Design considerations for a noncircular Tokamak demonstration plant [GA-A-14074] 15 p0351 A77-22968
- The 120-keV beam direct conversion system for TFTR injectors [UCRL-52137] 15 p0355 A77-23610
- Tokamak hybrid study [PPPL-1284] 15 p0358 A77-23942
- What is past is prologue: Future directions in Tokamak power reactor design research [UWPM-175] 15 p0358 A77-23951
- Pulsed energy and switching requirements for Tokamak ohmic heating [LA-UR-76-2473] 15 p0397 A77-27932
- Tokamak experimental power reactor [CONF-761107-23] 15 p0397 A77-27946
- Review of the state of the art with Tokamaks in USSR [EUR-CRA-FC-839-TR] 16 p0541 A77-31981
- JET project (design proposal) --- Tokamak experiment [EUR-5516] 16 p0549 A77-32914
- TORNADOES**
- Tornado-type wind energy system - Basic consideration [ASME PAPER 76-WA/ENER-2] 14 p0185 A77-26431
- TOROIDAL PLASMAS**
- Possibility of medium energy neutral beam injection into stellarator reactor 14 p0184 A77-26093
- The magnetic energy storage system used in ZT-1 --- toroidal plasma pinch experiment 15 p0299 A77-36314
- Neutral injection at PPPL, past and present --- in toroidal plasma devices 16 p0407 A77-41698
- Additional heating in JET --- plasma energy confinement in Joint European Tokamaks 16 p0407 A77-41718
- Review of toroidal theta-pinch theory 16 p0427 A77-45628
- Optimization of confinement in a toroidal plasma subject to strong radial electric fields 16 p0438 A77-47958
- TORQUE**
- Rotor/generator isolation for wind turbines [AIAA 77-372] 14 p0180 A77-25782
- TORQUE CONVERTERS**
- Wind tunnel performance data for the Darrieus wind turbine with NACA 0012 blades [SAND-76-0130] 14 p0214 A77-18057
- TOWED BODIES**
- Flight test development of a helicopter-towed surface delivery system 15 p0317 A77-38006
- TOWERS**
- Tower-type solar energy plant - Configuration and energy efficiency of concentrator 14 p0143 A77-21314

# SUBJECT INDEX

# TRANSPORT AIRCRAFT

Solar tower characteristics 15 p0274 A77-33333

Solar flux density distributions on central tower receivers 16 p0484 A77-49038

Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 KW wind turbine tower [NASA-TM-X-73548] 13 p0114 A77-13534

Solar tower characteristics 14 p0237 A77-21562

Vibration characteristics of a large wind turbine tower on non-rigid foundations [NASA-TM-X-73670] 15 p0378 A77-26613

**TOXIC HAZARDS**

Disposal of toxic wastes. I - Electroplating and electrochemical machining wastes. II - Poisonous and radioactive wastes 15 p0305 A77-36608

**TOXICITY**

JP-4 and JP-9 fuel toxicity studies using water fish and aufwuchs [AD-A027594] 13 p0127 A77-15213

Aerosol research and development related to health hazards analysis [LA-6539-PR] 15 p0385 A77-26703

**TRACE CONTAMINANTS**

XRF analysis of some regenerated catalysts [NRL-TN-388] 15 p0376 A77-26247

**TRACKING (POSITION)**

Design of a tracking system for a solar-energy installation 13 p0015 A77-11919

An automatic solar disk tracking system for incident energy measurements 14 p0138 A77-20749

A self-contained solar powered tracking device [ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477

The sun-tracking control of solar collectors using high-performance step motors 15 p0291 A77-35030

Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking [NASA-CASE-MPS-23267-1] 14 p0228 A77-20401

Sun tracking solar energy collector [NASA-CASE-NPO-13921-1] 15 p0363 A77-24590

**TRACKING NETWORKS**

The linear Fresnel lens solar concentrator: Transverse tracking error effects [NASA-CR-2889] 16 p0521 A77-29606

**TRACKING STATIONS**

Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber [SAND-76-8663] 14 p0248 A77-21674

**TRADEOFFS**

Trade-off analyses for multi-objective transportation plans 13 p0102 A77-11911

**TRANSFER FUNCTIONS**

Transfer function analysis of heat pipes 13 p0119 A77-14385

**TRANSFER ORBITS**

An energy management guidance scheme applicable to the interim upper stage --- for orbital transfer maneuvers [AD-A034005] 15 p0353 A77-23143

**TRANSIENT HEATING**

A two-dimensional finite difference solution for the transient thermal behavior of tubular solar collector 13 p0083 A77-10105

Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir [PB-261562/3] 14 p0252 A77-21726

**TRANSIENT LOADS**

The turbo-generator with superconducting field winding in transient operation [BLL-BTS-10351] 15 p0360 A77-24381

**TRANSIENT RESPONSE**

Transient performance characteristics of a high temperature distributed solar collector field 13 p0037 A77-12810

An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system 16 p0437 A77-47752

Preliminary report on the CTS transient event counter performance through the 1976 spring eclipse season [NASA-TM-X-73487] 13 p0083 A77-10116

**TRANSISTORS**

Effect of components on converters --- solar cell array transistor and thyristor performance 14 p0153 A77-21841

Miniature applications for photovoltaic generators 14 p0155 A77-21853

**TRANSITION METALS**

Coal liquefaction with soluble transition-metal complexes 13 p0070 A77-18584

**TRANSMISSION CIRCUITS**

Microwave transmission system for space power 13 p0014 A77-11818

Pulsed energy and switching requirements for Tokamak ohmic heating [LA-UR-76-2473] 15 p0397 A77-27932

**TRANSMISSION EFFICIENCY**

Characteristics of a system for transmitting concentrated solar radiation 13 p0051 A77-14578

Waveguide high pass filter for thermal conversion of solar energy 13 p0073 A77-19054

Microwave energy transmission [AIAA PAPER 77-540] 15 p0266 A77-32063

Features of systems for transmission of concentrated solar radiation 15 p0290 A77-34972

An analytical study of the maximal heat-carrying capacity of heat pipes 16 p0411 A77-42260

Anik B, the new Canadian domestic satellite 16 p0499 A77-49249

**TRANSMISSION LINES**

Comparative cost study of the processes for producing niobium-tin (Nb3 Sn) superconducting tapes for their application to power transmission lines [ERDA-76-160] 15 p0387 A77-26999

Power transmission project [BNL-22202] 16 p0551 A77-33426

**TRANSMISSIONS (MACHINE ELEMENTS)**

Improving automobile fuel economy with advanced transmissions 16 p0444 A77-48704

Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705

**TRANSMITTANCE**

Radiant transmittance of V-corrugated transparent sheets with application to solar collectors [ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506

**TRANSMITTER RECEIVERS**

Test program for transmitter experiment package and heat pipe system for the communications technology satellite [NASA-TM-X-3455] 13 p0095 A77-11268

**TRANSMITTERS**

Transmitter experiment package for the communications technology satellite [NASA-CR-135035] 15 p0360 A77-24332

**TRANSPARENCY**

Radiant transmittance of V-corrugated transparent sheets with application to solar collectors [ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506

**TRANSPONDERS**

Anik B, the new Canadian domestic satellite 16 p0499 A77-49249

**TRANSPORT AIRCRAFT**

The next-generation subsonic transport [SAWE PAPER 1127] 13 p0016 A77-12195

Layout and flight performance of a hypersonic transport /HST/ [DGLR PAPER 76-198] 13 p0060 A77-16575

Fuel consumption of civil jet transport aircraft 13 p0062 A77-17234

Energy utilization factor in civil transport aircraft 15 p0307 A77-36788

The liquid hydrogen option for the subsonic transport - A status report 16 p0458 A77-48819

LH2 airport requirements study [NASA-CR-2700] 13 p0083 A77-10032

# TRANSPORT PROPERTIES

# SUBJECT INDEX

Hydrogen-fueled subsonic aircraft: A perspective  
13 p0084 N77-10344

Energy consumption characteristics of transports  
using the prop-fan concept  
[NASA-CR-137937] 13 p0118 N77-14029

Energy consumption characteristics of transports  
using the prop-fan concept: Summary report  
[NASA-CR-137938] 13 p0118 N77-14030

Some early perspectives on ground requirements of  
liquid hydrogen air transports  
14 p0243 N77-21628

Innovative Aircraft Design Study (IADS) task 2,  
volume 1  
[AD-A041234] 16 p0531 N77-31141

An evaluation of very large airplanes and  
alternative fuels: Executive summary  
[AD-A042112] 16 p0550 N77-33154

**TRANSPORT PROPERTIES**

Organization of long range transport of air  
pollution monitoring in Europe  
13 p0071 A77-18754

An analytical study of the maximal heat-carrying  
capacity of heat pipes  
16 p0411 A77-42260

Energy and Physics: General Conference of the  
European Physical Society  
[AD-A026962] 13 p0131 N77-15511

**TRANSPORT THEORY**

Transport theory of 3M high-performance  
thermoelectric materials  
13 p0042 A77-12848

**TRANSPORTATION**

A derived demand model of energy demand in the  
transportation sector  
15 p0319 A77-38217

Conference report: Energy Conservation in  
Transportation and Construction  
[PB-255857/5] 13 p0100 N77-11562

Analysis of fiscal year 1977 DOT program by policy  
and RD and D management objectives. Program  
levels for fiscal years 1975, 1976, 1977, volume 1  
[PB-255401/2] 13 p0117 N77-13922

Increased fuel economy in transportation systems  
by use of energy management - second year's  
program  
[PB-257177/6] 13 p0133 N77-15930

Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 1: Digest of detailed data  
base descriptions  
[UCID-17316-PT-1] 15 p0387 N77-27036

Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 2: Detailed data base  
descriptions  
[UCID-17316-PT-2] 15 p0387 N77-27037

Hydrogen-via-electricity: A candidate  
transitional transportation energy system concept  
[ERDA-77-13] 16 p0514 N77-28596

Some thoughts on optimizing long-distance heat  
transport systems and their storage facilities  
[AD-A038253] 16 p0516 N77-28608

Quarterly report to US House and Senate Committees  
on Appropriations (3rd)  
[PB-265490/3] 16 p0517 N77-28616

Energy statistics: A supplement to the summary of  
national transportation statistics  
[PB-269301/8] 16 p0559 N77-33672

**TRANSPORTATION ENERGY**

Air transportation energy efficiency -  
Alternatives and implications  
[SAWE PAPER 1124] 13 p0016 A77-12192

An alternative fuel for cars --- hydrogen  
production and storage  
13 p0050 A77-14530

Energy consumption in various modes of  
transportation  
13 p0050 A77-14561

Evolution of the concept of the automobile from  
the standpoint of saving energy  
13 p0051 A77-14562

Air transportation and fuel consumption  
13 p0051 A77-14563

Energy recovery in railway and road transportation  
13 p0051 A77-14564

Alternate fuels for road vehicles of the future  
13 p0051 A77-14584

Transport systems guarantee efficient utilization  
of energy resources  
13 p0053 A77-15048

Problems of transportation power plants  
14 p0136 A77-20004

Commuter van programs - An assessment  
14 p0137 A77-20391

Applications of new systems to urban transportation  
14 p0137 A77-20392

The design and development of a hybrid-electric  
urban transit vehicle  
14 p0159 A77-22876

A comparison between the primary energy  
consumption of electric and gasoline powered  
vehicles  
14 p0159 A77-22885

Basic requirements for the various items of  
equipment for supplying energy to electrically  
driven road vehicles from the point of view of  
the user  
14 p0160 A77-22890

Comparison of an electric versus a gasoline  
powered utility truck in two years of a service  
test program  
14 p0160 A77-22891

Development of a high performance and lightweight  
hybrid flywheel/battery powered electric vehicle  
drive  
14 p0160 A77-22898

Development of large size nickel-zinc cells for  
electric vehicles  
14 p0161 A77-22911

The DDO bus, a suburban bus with electric drive,  
supplied either from overhead wire or from battery  
14 p0161 A77-22913

Basic research problems in the generation of  
electrochemical energy for powering small  
private vehicles  
14 p0180 A77-25721

The application of linear programming methods to  
the problem of choosing required reserves of  
energy for controlled plants  
14 p0196 A77-28255

Energy storage propulsion system for advanced  
concept train --- braking energy recovery  
14 p0200 A77-29467

Application of gravitational energy exchange to  
tracked urban transit systems  
14 p0200 A77-29468

Modeling of electric drive systems for KEW  
/flywheel/ vehicles  
14 p0200 A77-29469

Efficient energy utilization  
15 p0264 A77-31578

Use of a Lowry-type spatial allocation model in an  
urban transportation energy study  
15 p0265 A77-31899

Development of a liquid hydrogen car  
15 p0282 A77-33394

The auto option --- bus usage in urban areas  
15 p0310 A77-36983

Running out of steam. III --- alternatives to  
internal combustion engine  
15 p0310 A77-36984

Hydrogen-via-Electricity - A candidate  
transitional transportation energy system concept  
[AIAA 77-1034] 16 p0405 A77-41570

Have energy, will travel --- alternative aviation  
energy sources in the future  
16 p0409 A77-41933

The impact of the energy crisis on the demand for  
fuel efficiency - The case of general aviation  
16 p0410 A77-42038

Cryogenic fuel systems for motor vehicles  
16 p0411 A77-42166

Synthetic fuels and combustion  
16 p0439 A77-48159

The zinc-bromine battery - Possible candidate for  
electric vehicles and load leveling  
16 p0446 A77-48725

The design and development of a 30 kW-hr  
lithium-aluminum/iron sulfide electric vehicle  
battery  
16 p0446 A77-48726

Design of a current technology electric vehicle  
16 p0446 A77-48727

Flywheel module for electric vehicle regenerative  
braking  
16 p0447 A77-48728

# SUBJECT INDEX

# TURBINES

- Thermal energy storage and transportation  
16 p0497 A77-49153
- Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643
- Utility facilities in transportation corridors  
[PB-255635/5] 13 p0093 N77-10970
- Optimizing the use of materials and energy in transportation construction  
[PB-253713/2] 13 p0096 N77-11475
- Assessing the relationship between urban form and travel requirements: A literature review and conceptual framework  
[PB-254988/9] 13 p0102 N77-11923
- Future scenarios for urban transportation  
[PB-255349/3] 13 p0102 N77-11930
- TRISNET. Directory to transportation research information resources  
[PB-255172/9] 13 p0125 N77-14939
- Alternative fuels for aviation  
[GPO-78-544] 13 p0127 N77-15212
- First World Hydrogen Energy Conference proceedings, volume 3  
14 p0243 N77-21626
- Fuel subsystem characteristics for LH2 aircraft  
14 p0243 N77-21630
- Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975  
14 p0244 N77-21634
- A hydrogen-powered mass transit system  
14 p0244 N77-21638
- Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 1: Digest of detailed data base descriptions  
[UCID-17316-PT-1] 15 p0387 N77-27036
- Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 2: Detailed data base descriptions  
[UCID-17316-PT-2] 15 p0387 N77-27037
- Transportation Energy Conservation Data Book, supplement 2  
[ORNL-5247-SUPPL-2] 16 p0542 N77-32036
- TRAPPED MAGNETIC FIELDS  
Superconducting magnetic energy storage  
[LA-UR-76-2047] 15 p0397 N77-27933
- TRAPPED PARTICLES  
Possibility of medium energy neutral beam injection into stellarator reactor  
14 p0184 A77-26093
- TREADMILLS  
Pace and grade related to the oxygen and energy requirements, and the mechanics of treadmill running  
15 p0396 N77-27689
- TRENDS  
Domestic and world trends (1980 - 2000) affecting the future of aviation  
[NASA-CP-144838] 13 p0126 N77-14981
- Trends in world oil prices and production  
[PB-268411/6] 16 p0547 N77-32607
- TRITIUM  
Energy storage possibilities of atomic hydrogen  
14 p0245 N77-21643
- TROPICAL METEOROLOGY  
Solar energy in tropical and subtropical countries  
16 p0421 A77-44449
- TROPICAL REGIONS  
The OTEC answer to OPEC - Solar sea power  
15 p0303 A77-36409
- Solar air conditioning applications for warm humid climate  
16 p0496 A77-49147
- TROPOSPHERE  
Tropospheric oxidation H2S  
16 p0411 A77-42254
- Utilization of wind energy for electrical power supplies to ESSOR stationary platforms --- tropospheric tethered balloon experiment  
16 p0427 A77-45610
- TRUCKS  
On-the-road evaluation of the efficiency of propulsion system of city vans  
14 p0160 A77-22888
- Comparison of an electric versus a gasoline powered utility truck in two years of a service test program  
14 p0160 A77-22891
- Opportunities for battery powered road vehicles  
14 p0160 A77-22892
- Development of electric vehicles at Toyota  
14 p0161 A77-22904
- Truck fleet experience with fuel economy improvement measures  
[PB-263022/6] 15 p0361 N77-24514
- TUBE HEAT EXCHANGERS  
Performance of an annular cylindrical solar collector  
13 p0073 A77-19059
- Performance evaluation on the Owens-Illinois Sunpack solar energy collector  
[ASHE PAPER 76-WA/SOL-16] 14 p0189 A77-26521
- Indoor test methods to determine the effect of vacuum on the performance of a tubular flat plate collector --- for solar energy conversion  
[ASHE PAPER 76-WA/SOL-24] 14 p0190 A77-26529
- TUNGSTEN  
The NASA thermionic-conversion /TEC-ART/ program  
16 p0438 A77-47960
- TUNGSTEN CARBIDES  
Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte  
13 p0055 A77-15815
- Influence of bonding and filling agents on the activity of tungsten carbide hydrogen electrodes  
15 p0260 A77-31173
- TUNNEL DIODES  
Theory of metal-insulator-semiconductor solar cells  
14 p0156 A77-22038
- Tunnel MIS solar cells  
14 p0163 A77-22979
- A minority carrier MIS solar cell  
15 p0288 A77-33799
- TURBINE BLADES  
Numerical solution for the unsteady lifting characteristics of variable pitch cross-flow wind turbines  
13 p0044 A77-12871
- Design consideration for the Darrieus rotor --- wind turbines  
13 p0044 A77-12872
- The application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine  
14 p0156 A77-22142
- Future propulsion plants. I  
15 p0268 A77-32251
- Fluid dynamics of diffuser augmented wind turbines  
16 p0467 A77-48899
- Wind tunnel performance data for the Darrieus wind turbine with NACA 0012 blades  
[SAND-76-0130] 14 p0214 N77-18057
- A 100-kW metal wind turbine blade basic data, loads and stress analysis  
[NASA-CR-134956] 14 p0236 N77-21467
- A 100-kW wind turbine blade dynamics analysis, weight-balance, and structural test results  
[NASA-CR-134957] 14 p0236 N77-21468
- Sandia vertical-axis wind turbine program  
[SAND-76-0338] 14 p0250 N77-21686
- TURBINE ENGINES  
Biphase turbines for diesel bottoming --- waste heat recovery  
16 p0449 A77-48755
- The use of mixture working fluids in geothermal binary power cycles  
16 p0455 A77-48802
- Performance test of a bladeless turbine for geothermal applications  
[UCID-17068] 14 p0212 N77-17581
- TURBINE PUMPS  
Design and field test of a steam powered downhole geothermal pump  
16 p0456 A77-48806
- Underground pumped storage research priorities  
[PB-254413/8] 13 p0089 N77-10667
- Geothermal down-well pumping system  
[PB-261857/7] 14 p0252 N77-21732
- TURBINE WHEELS  
Segmented and self-adjusting wind turbine rotors  
16 p0468 A77-48902
- Development of a turbine rotor of silicon nitride  
16 p0503 A77-50651
- TURBINES  
Recent Canadian activities in wind power  
16 p0470 A77-48916
- Wind energy conversion  
[PB-256198/3] 13 p0115 N77-13552

- Development of a vertical axis wind turbine (phase 1)  
[BMPT-FE-T-76-55] 14 p0209 N77-17112
- Status of the ERDA/Sandia 17-metre Darrieus turbine design  
[SAND-76-5683] 14 p0217 N77-18576
- Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories  
[SAWD-76-5712] 14 p0223 N77-19616
- Vertical-axis wind turbine technology workshop  
[SAND-76-5586] 14 p0250 N77-21688
- Vibration characteristics of a large wind turbine tower on non-rigid foundations  
[NASA-TN-X-73670] 15 p0378 N77-26613
- Diffuser augmentation of wind turbines  
[CONF-760842-6] 16 p0521 N77-29610
- Sandia vertical-axis wind turbine project  
[SAND-76-0581] 16 p0521 N77-29613
- High power study - power conditioning --- for magnetohydrodynamic generators and turbine driven alternators  
[AD-A038724] 16 p0522 N77-29625
- Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator  
[NASA-TN-73718] 16 p0529 N77-30611
- A non-aerospace application of plans: Preliminary structural design of wind turbine diffuser  
[RM-629] 16 p0534 N77-31604
- Wind energy conversion  
[PB-268718/4] 16 p0559 N77-33667
- TURBOCOMPRESSORS**
- A unique Rankine-cycle heat pump system  
13 p0036 A77-12799
- Improvements in fluid machines and systems for energy conversion. Volume 4 --- Book  
15 p0309 A77-36815
- Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification  
[SAE PAPER 770047] 16 p0424 A77-44557
- Investigating the starting modes of the GT-35 gas turbine plant --- turbocompressor tests  
16 p0426 A77-45324
- ERDA/PEWA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology  
16 p0446 A77-48721
- Effects of a thermal reactor on the energy efficiency of a turbocharged, stratified charge engine  
[AD-A026059] 13 p0128 N77-15409
- TURBOFAN ENGINES**
- Testing the annular combustor of the NK-8 aero-engine on natural gas --- for stationary gas turbine installation  
16 p0426 A77-45325
- Study of small turbofan engines applicable to single-engine light airplanes  
[NASA-CR-137944] 13 p0093 N77-11054
- Multi-mission uses for prop-fan propulsion  
15 p0339 N77-22127
- NASA Quiet Clean General Aviation Turbofan (QCGAT) program status  
[NASA-TN-X-73564] 15 p0353 N77-23109
- TURBOFANS**
- Noise mechanism separation and design considerations for low tip-speed, axial-flow fans  
13 p0046 A77-13339
- TURBOGENERATORS**
- Large-scale electrical power generation and storage  
13 p0006 A77-11039
- The Osmotic power plant  
13 p0021 A77-12668
- Solids gasification for gas turbine fuel 100 and 300 Btu gas  
13 p0022 A77-12685
- Production of methane using offshore wind energy  
13 p0026 A77-12722
- Energy conservation with advanced power generating systems  
13 p0026 A77-12723
- Thermal energy storage considerations for solar-thermal power generation  
13 p0027 A77-12732
- KIPS - Kilowatt Isotope Power System --- for use in satellites  
13 p0041 A77-12837
- Design consideration for the Darrieus rotor --- wind turbines  
13 p0044 A77-12872
- An experimental 200 kW vertical axis wind turbine for the Magdalen Islands  
13 p0044 A77-12874
- A combined cycle with a partial-oxidation reactor  
13 p0062 A77-17534
- Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator  
14 p0136 A77-20109
- The helium turbine - A power station of the future  
14 p0138 A77-20951
- Turbines and turbogenerators for solar power plants with thermodynamic cycles  
14 p0152 A77-21828
- 10 MW solar thermal electric power plant design for solar day operation  
14 p0153 A77-21842
- Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost  
14 p0154 A77-21845
- Simulation of wind turbine generator system power flow dynamics  
14 p0158 A77-22650
- Engineering development status of the Darrieus wind turbine  
14 p0166 A77-23365
- New requirements for the development and design of thermal power systems  
14 p0167 A77-23407
- Tornado-type wind energy system - Basic consideration  
[ASME PAPER 76-WA/ENER-2] 14 p0185 A77-26431
- Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling  
[ASME PAPER 77-GT-2] 14 p0197 A77-28522
- Solar generators - Utilization of solar energy for supply of electric power  
14 p0197 A77-28681
- Development of solar tower program in the United States  
14 p0204 A77-29591
- Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks  
15 p0267 A77-32243
- Closed Brayton cycle turbines for satellite solar power stations  
15 p0296 A77-35816
- Modeling aspects of a gas turbine solar-electric power system  
15 p0318 A77-38210
- Technical and economic aspects of industrial power-heat coupling. I  
15 p0334 A77-39674
- Solar thermal electricity - Power tower dominates research  
16 p0400 A77-40647
- Compressed air energy storage  
[AIAA 77-1008] 16 p0403 A77-41555
- Implementation issues of wind energy --- cost analysis  
[AIAA 77-1025] 16 p0404 A77-41565
- A theory and experimental investigation of ducted wind turbines  
16 p0410 A77-42072
- Variable speed wind turbines for high wind energy conversions  
16 p0410 A77-42074
- Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation  
16 p0439 A77-48092
- Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design  
16 p0461 A77-48844
- Recent Canadian activities in wind power  
16 p0470 A77-48916
- Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks  
[NASA-TN-X-73613] 14 p0220 N77-19580
- Central receiver solar thermal power system, collector subsystem  
[SAN/1111-75/1] 14 p0230 N77-20576

Central receiver solar thermal power system, phase 1  
[SAN/1110-76/T2] 14 p0248 N77-21668

High power study, superconducting generators  
[AD-A031620] 15 p0342 N77-22408

The turbo-generator with superconducting field  
winding in transient operation  
[ELL-BTS-10351] 15 p0360 N77-24381

**TURBOJET ENGINE CONTROL**  
Equation solution accuracy in calculating jet  
engine characteristics 13 p0020 A77-12502

Application of simulation studies to the design  
and improvement of fuel control systems for  
aviation turbine engines 13 p0054 A77-15798

**TURBOJET ENGINES**  
Pressure ratio optimization criteria in aircraft  
turbojet-engines design 13 p0062 A77-17258

Analysis of parameters and characteristics of a  
bypass turbojet engine operating in a cycle with  
stepwise heat removal 13 p0063 A77-17765

Influence of atmospheric conditions on the  
parameters of a turbojet engine 15 p0323 A77-39270

Development of a small, low cost turbojet engine  
with thrust augmentation --- for RPV 16 p0434 A77-47347

The impact of JP-4/JP-8 conversion on aircraft  
engine exhaust emissions  
[AD-A026546] 13 p0112 N77-13234

Potential improvements in engine performance using  
a variable geometry turbine 15 p0340 N77-22141

**TURBOMACHINERY**  
A possible saturation criterion for wind energy  
extraction 14 p0165 A77-23359

A two-phase rotary separator demonstration system  
for geothermal energy conversion 16 p0456 A77-48807

The helical screw expander evaluation project ---  
for geothermal wells 16 p0456 A77-48809

New turbodrill for geothermal drilling 16 p0456 A77-48810

Wind energy statistics for large arrays of wind  
turbines - New England and Central U.S. regions 16 p0490 A77-49091

Diffuser augmentation of wind turbines 16 p0490 A77-49093

Self-regulating composite bearingless wind turbine 16 p0491 A77-49095

The Darrieus Vertical-Axis Wind Turbine program at  
Sandia Laboratories 16 p0491 A77-49096

**TURBOPROP ENGINES**  
Multi-mission uses for prop-fan propulsion 15 p0339 N77-22127

**TURBORAMJET ENGINES**  
Performance characteristics of turbo-rockets and  
turbo-ramjets using high energy fuel 15 p0339 N77-22131

**TURBOROCKET ENGINES**  
Performance characteristics of turbo-rockets and  
turbo-ramjets using high energy fuel 15 p0339 N77-22131

**TURBOSHAPTS**  
The development of small regenerative gas turbines  
at MTU. II 16 p0401 A77-41258

Experience with a one stage variable geometry  
axial turbine 15 p0340 N77-22143

**TURBULENT BOUNDARY LAYER**  
Calculation of turbulent magnetohydrodynamic  
boundary layers in MHD generator channels 13 p0046 A77-13242

**TURBULENT FLOW**  
Turbulent flow structures and recirculation  
patterns associated with cyclone combustors and  
their effect on flame stabilisation 15 p0288 A77-33838

**TURNING FLIGHT\***  
Energy-turn-rate characteristics and turn  
performance of an aircraft 15 p0265 A77-31855

**TWO DIMENSIONAL FLOW**

Investigation of two-dimensional electric effects  
in a sectional MHD-channel 15 p0317 A77-37930

**TWO PHASE FLOW**  
Liquid-metal MHD - Cycle studies and generator  
experiments 13 p0034 A77-12785

Study of the properties of heat pipes with  
liquid-metal heat-transfer agents in  
low-temperature regimes 13 p0046 A77-13243

Two-phase working fluids for the temperature range  
100-350 C --- in heat pipes for solar applications  
[AIAA PAPER 77-753] 15 p0312 A77-37266

A structured surface for high performance  
evaporative heat transfer 15 p0312 A77-37283

Sodium-nitrogen liquid-metal MHD facility initial  
test results 15 p0327 A77-39549

Performance of a total-flow impulse turbine for  
geothermal applications 16 p0456 A77-48808

On pressure-work, viscous dissipation and the  
energy balance relation for geothermal reservoirs 16 p0505 A77-51256

Two-phase flow in geothermal energy sources  
[TID-27129] 14 p0250 N77-21689

Two-phase Hartmann flows in the MHD generator  
configuration  
[AD-A036452] 16 p0518 N77-28948

Internal heat transfer experiments in a simulated  
OTEC evaporator tube  
[APL/JHU/AEO-76-066] 16 p0521 N77-29611

**TWO STAGE TURBINES**  
Design phase utility analysis for gas turbine and  
combined cycle plants  
[PB-256665/1] 13 p0115 N77-13553

**U****U.S.S.R.**

Role of the nuclear energy system in the total  
fuel-energy picture in the USSR 15 p0267 A77-32220

Review of the state of the art with Tokamaks in USSR  
[EUR-CEA-FC-839-TR] 16 p0541 N77-31981

**U.S.S.R. SPACE PROGRAM**  
Energy - Ecospace --- space law aspects of U.S.  
and U.S.S.R. solar power proposals  
[IAP PAPER ISL-76-59] 13 p0004 A77-10970

**ULTRASONIC RADIATION**  
Development of signal processing algorithms for  
ultrasonic detection of coal seam interfaces  
[NASA-CR-150024] 13 p0085 N77-10610

**ULTRAVIOLET RADIATION**  
Near-uv photon efficiency in a TiO<sub>2</sub> electrode -  
Application to hydrogen production from solar  
energy 13 p0015 A77-11947

**UNDERGROUND EXPLOSIONS**

Fracturing oil shale with explosives for in situ  
recovery 14 p0169 A77-23559

**UNDERGROUND STORAGE**

Compressed air energy storage - A near term option  
for utility application 13 p0027 A77-12727

Underground storage of off-peak power 13 p0027 A77-12728

Technical and environmental aspects of underground  
hydrogen storage 15 p0279 A77-33379

Underground gasification --- of coal for deep  
deposit in situ processing 15 p0308 A77-36813

Application of heat pipes to ground storage of  
solar energy  
[AIAA PAPER 77-729] 15 p0324 A77-39507

Wolfsberg - A subterranean storage place for  
natural gas at a depth of 3000 m 15 p0334 A77-39669

Natural gas storage in salt caverns 15 p0334 A77-39670

Compressed air energy storage  
[AIAA 77-1008] 16 p0403 A77-41555

- Conceptual design of underground compressed air storage electric power systems 16 p0451 A77-48770
- Underground pumped storage research priorities [PB-254413/8] 13 p0089 N77-10667
- A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve [PB-255948/2] 13 p0105 N77-12500
- Technical and environmental aspects of underground hydrogen storage 14 p0242 N77-21613
- Strategic petroleum reserve. Draft environmental impact statement for Ironston Mine [PB-262451/8] 15 p0362 N77-24573
- Strategic petroleum reserve. Bryan Mound salt dome [PB-262839/4] 15 p0362 N77-24579
- Strategic petroleum reserve. Supplement final environmental impact statement. West Hackberry salt dome [PB-265796/3] 16 p0520 N77-29597
- UNDERGROUND STRUCTURES**
- Remote sensing of an underground coal-burn cavity with a wide-band induction system 13 p0007 A77-11050
- Seasonal storage of thermal energy in water in the underground --- reservoirs 13 p0028 A77-12734
- A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems 13 p0058 A77-16306
- Aerodynamics as a subway design parameter 13 p0070 A77-18721
- Underground coal gasification - A status report 16 p0441 A77-48473
- Strategic petroleum reserve. Final environmental impact statement, volume 1 [PB-261799/1] 15 p0349 N77-22675
- Strategic petroleum reserve. Final environmental impact statement, volume 2 [PB-261800/7] 15 p0349 N77-22676
- UNDERWATER ENGINEERING**
- Ocean Thermal Energy Conversion (OTEC) 16 p0526 N77-30278
- UNDERWATER STRUCTURES**
- Aluminum-based anodes for underwater fuel cells: A phase report [AD-A026405] 13 p0131 N77-15512
- UNITED KINGDOM**
- Energy and the coal industry 13 p0005 A77-11030
- Energy research in the UK 13 p0055 A77-15812
- A simple model for solar energy economics in the U.K. 15 p0298 A77-36245
- Operation cough drop 14 p0247 N77-21665
- UNITED NATIONS**
- Description of the solar energy R and D programs in many nations [SAR/1122-76/1] 14 p0225 N77-19648
- UNITED STATES OF AMERICA**
- Summary of 1976 geothermal drilling - Western United States 15 p0286 A77-33522
- The year 2000 - Energy enough 15 p0306 A77-36725
- North Slope oil and United States energy supply 15 p0309 A77-36823
- A United States energy model economically driven by a global growth simulation 15 p0319 A77-38220
- Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132
- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts east of the Mississippi [PB-255176/0] 13 p0112 N77-13229
- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts west of the Mississippi [PB-255177/8] 13 p0112 N77-13230
- IEA energy simulation model: A framework for long-range US energy analysis [ORA0-125] 13 p0122 N77-14594
- Trends in refinery capacity and utilization: Petroleum refineries in the United States; foreign refinery exporting centers [PB-256966/3] 13 p0132 N77-15523
- A study of geothermal prospects in the western United States [NASA-CR-149812] 14 p0220 N77-19575
- Regional energy system for the planning and optimization of national scenarios (RESPONS). Clean coal energy: Source-to-use economics project [ERDA-76-109] 14 p0222 N77-19602
- Technical and economic aspects of potential US district heating systems [BNL-21287] 14 p0232 N77-20594
- Energy and the future 14 p0246 N77-21657
- US options for a transition from oil and gas to synthetic fuels 14 p0247 N77-21661
- A simplified equilibrium model of the US energy-economic system and its use in comparing alternatives 14 p0247 N77-21662
- Operation cough drop 14 p0247 N77-21665
- Outer continental shelf oil and gas costs and production volume: Their impact on the nation's energy balance to 1990 [PB-262533/3] 15 p0343 N77-22604
- Strategic petroleum reserve. Final environmental impact statement, volume 1 [PB-261799/1] 15 p0349 N77-22675
- Stochastic modelling of site wind characteristics [PB-261178/8] 15 p0351 N77-22775
- Preliminary investigation. Nonproducing gas reserves onshore United States and in the Gulf of Mexico offshore state area, as reported in Federal Commission form 15 [PB-263434/3] 15 p0355 N77-23597
- Alternative patterns of industrial energy consumption in the Northeast [BNL-50555] 15 p0364 N77-24597
- Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply [PB-263761/9] 15 p0367 N77-24635
- Internalizing social costs in power plant siting: Some examples for coal and nuclear plants in the United States [CONF-761103-16] 15 p0386 N77-26816
- Supply of liquefied natural gas to the Northeast [BNL-50556] 15 p0392 N77-27521
- Factors affecting the electric power supply, 1980-85: Executive summary and recommendations [PB-264760/0] 15 p0395 N77-27560
- Long-term natural resource availability: Environmental and political implications in the United States [PB-265762/5] 16 p0511 N77-28327
- Projects to expand fuel sources in western states. Survey of planned or proposed coal oil shale, tar sand, uranium, and geothermal supply expansion projects, and related infrastructure, in states west of the Mississippi River (as of May 1976) [PB-265633/8] 16 p0516 N77-28614
- Strategic petroleum reserve. Supplement final environmental impact statement. West Hackberry salt dome [PB-265796/3] 16 p0520 N77-29597
- Energetics of the United States of America: An atlas [BNL-50501] 16 p0522 N77-29615
- Energy situation [PB-266836/6] 16 p0530 N77-30633
- Proceedings of the Workshop on Analysis of 1974 and 1975 Power Growth [EPRI-PA-318-SR] 16 p0536 N77-31633
- Solar energy: Policy and prospects [PB-267986/8] 16 p0554 N77-33620
- US energy flow in 1976 [UCID-17443] 16 p0557 N77-33639
- UNIVERSITIES**
- Energy conservation on campus. Volume 1: Guidelines [PB-266211/2] 16 p0524 N77-29636
- Energy conservation on campus. Volume 2: Case studies [PB-266212/0] 16 p0524 N77-29637



## SUBJECT INDEX

## URBAN TRANSPORTATION

## UNSTEADY FLOW

- Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills  
16 p0467 A77-48896

## URANIUM

- Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10090] 14 p0214 A77-18511
- United States special format report: Performance of the Sohio Solar Water Heating System using large area plastic collectors (Grants, New Mexico) [SAN/1038-76/1] 15 p0365 A77-24606
- Determination of low activities of U-Ba-series elements by a liquid-scintillation spectrometer [BIL-SMRE-TRANS-6562-(8313.4)] 15 p0371 A77-25485
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California [UCRL-52180] 16 p0536 A77-31628

## URANIUM ISOTOPES

- Field ionization for laser isotope separation [EPRI-NP-334] 16 p0552 A77-33512

## URBAN DEVELOPMENT

- A progress report on the national program for solar heating and cooling  
14 p0170 A77-23656
- Hydrogen in the seaward advancement of industrial societies --- offshore energy production  
15 p0285 A77-33417
- Types of city development, energy supply, and possibilities for optimization  
15 p0338 A77-40349
- Solar energy and urban settlements  
16 p0494 A77-49127
- Growth effects of major land use projects. Volume 2: Compilation of land use based emission factors [PB-255302/2] 13 p0092 A77-10709

## URBAN PLANNING

- Increase in the efficiency of heat and power systems using large artificial accumulators of heat  
13 p0064 A77-17939
- Lumiducts for Ecopolis --- urban solar light collection and transmission system  
13 p0079 A77-19116
- Decision making in the utilisation of the organic fraction of municipal wastes  
15 p0299 A77-36272
- Waste resources - Problems and promise --- for urban energy conversion [ASME PAPER 77-ENAS-49] 16 p0432 A77-46890
- Thermal processing of municipal solid waste for resource and energy recovery --- Book  
16 p0438 A77-47951
- Solar energy and urban settlements  
16 p0494 A77-49127
- Resource recovery technology for urban decision-makers [PB-252458/5] 13 p0093 A77-10964
- Design of municipal services in support of high rise office buildings [PB-262532/5] 15 p0370 A77-25021
- RAWN utilization experience (case studies 32 through 41) --- research applied to national needs [PB-263683/5] 15 p0370 A77-25027
- Weather, climate and human settlements [WHO-448] 15 p0387 A77-27038
- Heat transportation by hot water pipe-lines at 90 deg C [AD-A038301] 16 p0512 A77-28453
- Federal assistance programs and energy development-impacted municipalities [PB-265804/5] 16 p0519 A77-29026

## URBAN RESERARCH

- Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864
- Municipal solid waste as a resource for energy recovery and conservation  
15 p0313 A77-37655
- Description of Provident House, King City, Ontario  
16 p0495 A77-49133
- Development of a multi-disciplinary ERTS user program in the state of Ohio [E77-10045] 13 p0104 A77-12475
- URBAN TRANSPORTATION**
- The fuel efficiency potential of a flywheel hybrid vehicle for urban driving  
13 p0020 A77-12664

- Load leveling with electric vehicles in the urban environment  
13 p0024 A77-12701
- Selection of driving cycles for electric vehicles of the 1990's  
13 p0024 A77-12702
- Performance of a hydrogen-powered transit vehicle  
13 p0033 A77-12781
- Transport of the future and the tasks of science  
13 p0048 A77-13643
- Energy recovery in railway and road transportation  
13 p0051 A77-14564
- Transport systems guarantee efficient utilization of energy resources  
13 p0053 A77-15048
- Aerodynamics as a subway design parameter  
13 p0070 A77-18721
- Evaluating revenue sources for public transit - A new frontier for environmental planners  
13 p0070 A77-18723
- Economic and social impact of solar powered transportation systems  
13 p0079 A77-19120
- Commuter van programs - An assessment  
14 p0137 A77-20391
- Applications of new systems to urban transportation  
14 p0137 A77-20392
- The design and development of a hybrid-electric urban transit vehicle  
14 p0159 A77-22876
- Hybrid propulsion systems for electric road vehicles for short range public passenger transport test and operational experience - Prospects  
14 p0159 A77-22881
- User experience with the Enfield car --- electric motor vehicle  
14 p0159 A77-22884
- Flywheel-electric hybrid vehicle  
14 p0159 A77-22886
- Development cost effective battery electric road vehicles  
14 p0160 A77-22889
- Opportunities for battery powered road vehicles  
14 p0160 A77-22892
- Studies of electric vehicle drives, illustrated by the example of an urban estate car  
14 p0160 A77-22893
- The M.A.N. electrobus experience gained in large-scale tests  
14 p0160 A77-22900
- Impacts of future use of electric cars in US cities  
14 p0161 A77-22902
- The DUO bus, a suburban bus with electric drive, supplied either from overhead wire or from battery  
14 p0161 A77-22913
- Energy storage propulsion system for advanced concept train --- braking energy recovery  
14 p0200 A77-29467
- Application of gravitational energy exchange to tracked urban transit systems  
14 p0200 A77-29468
- A development of high efficiency electric mini-cars  
14 p0201 A77-29470
- Report on Joint Conference Eno Foundation Board of Directors and Board of Consultants, October 13 and 14, 1976  
15 p0260 A77-31064
- Use of a Lowry-type spatial allocation model in an urban transportation energy study  
15 p0265 A77-31899
- Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975  
15 p0282 A77-33396
- The politics of urban transportation innovation  
15 p0287 A77-33600
- A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen  
15 p0302 A77-36343
- The auto option --- bus usage in urban areas  
15 p0310 A77-36983
- Urban transportation technology --- Book  
15 p0324 A77-39467
- The use of composite flywheels for braking energy recovery in road transport vehicles  
16 p0401 A77-41351

- A study of the effects of new transportation systems on urban transportation and environment by computer simulation 16 p0430 A77-46652
- Is an electric vehicle in your future 16 p0441 A77-48301
- Design of a current technology electric vehicle 16 p0446 A77-48727
- Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153
- Trade-off analyses for multi-objective transportation plans 13 p0102 N77-11911
- Assessing the relationship between urban form and travel requirements: A literature review and conceptual framework [PB-254988/9] 13 p0102 N77-11923
- Future scenarios for urban transportation [PB-255349/3] 13 p0102 N77-11930
- Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576
- Personal rapid transit research conducted at the Aerospace Corporation [PB-256846/7] 13 p0111 N77-12946
- Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van [NASA-TM-X-73638] 14 p0236 N77-21549
- A hydrogen-powered mass transit system 14 p0244 N77-21638
- Assessment of fuel-conservation potential of a ground-transportation system due to full utilization of its mass transportation capabilities [PB-262125/8] 15 p0347 N77-22657
- The potential for transit as an energy saving option [PB-263087/9] 15 p0359 N77-24019
- Transportation programming, economic analysis, and evaluation of energy constraints [PB-262878/2] 15 p0370 N77-25018
- Design of municipal services in support of high rise office buildings [PB-262532/5] 15 p0370 N77-25021
- Study of future paratransit requirements [PB-264082/9] 15 p0376 N77-26028
- Evaluation of rail rapid transit and express bus service in the urban commuter market [PB-265236/0] 15 p0398 N77-28046
- Costs and energy efficiency of a dual-mode system [NASA-CR-154251] 16 p0518 N77-29003
- USER MANUALS (COMPUTER PROGRAMS)**
- Computer program grade 2 for the design and analysis of heat-pipe wicks [NASA-CR-137954] 13 p0118 N77-14375
- User manual for GEOCOST: A computer model for geothermal cost analysis. Volume 2: Binary cycle version [BNWL-1942-V2] 15 p0345 N77-22632
- A user's guide to the MIT world energy demand data base. Part 2: Data index [PB-266830/9] 16 p0539 N77-31660
- USER REQUIREMENTS**
- Software aspects of super composites --- composition selection to meet user requirements 13 p0053 A77-15301
- Basic requirements for the various items of equipment for supplying energy to electrically driven road vehicles from the point of view of the user 14 p0160 A77-22890
- UTAH**
- University of Utah direct contact Geothermal Power Project report. A computer program for determining the thermodynamic properties of water [UTEC-ME-76-171] 15 p0380 N77-26642
- Earthquake surveys of the Foosevelt Hot Springs and the Cove Fort areas, Utah, volume 4 [PB-268421/5] 16 p0544 N77-32574
- UTILITIES**
- Energy conservation potential of Modular Integrater Utility Systems /MIGS/ 13 p0026 A77-12724
- Fuel cells - Prospects of their applications for electric utilities 14 p0165 A77-23306
- Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks 15 p0267 A77-32243
- An assessment of energy storage systems suitable for use by electric utilities 15 p0310 A77-36982
- Union Electric Company's 8000 ton per day solid waste utilization system 15 p0313 A77-37656
- Environmental studies of the St. Louis-Union Electric refuse firing demonstration 15 p0315 A77-37669
- Recent progress in development of sodium-sulfur battery for utility application 16 p0448 A77-48740
- Feasibility study of an Integrated Energy/Utility System at the University of Florida 16 p0449 A77-48751
- The application of wind power systems to the Minnesota Power and Light Company 16 p0490 A77-49092
- Large windpower systems integrated with existing electric utilities 16 p0490 A77-49094
- Effect of solar home heating on electric utilities 16 p0494 A77-49123
- An off-peak energy storage concept for electric utilities. I - Electric utility requirements 16 p0499 A77-49348
- Utility facilities in transportation corridors [PB-255635/5] 13 p0093 N77-10970
- Batteries for utility load leveling [CONF-760469-3] 14 p0231 N77-20579
- Electric utility finance workshop [PB-261661/3] 15 p0349 N77-22677
- Study of the electric utility industry demand, costs, and rates [PB-262843/6] 15 p0367 N77-24631
- Electric utility coal consumption and generation trends, 1976-1985 [PB-262483/1] 15 p0374 N77-25667
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary [NASA-CR-134949-VOL-1] 15 p0379 N77-26631
- Energy Conversion Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach [NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles [NASA-CR-134949-VOL-2-PT-2] 15 p0379 N77-26633
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 3: Open cycle gas turbines and open cycle MHD [NASA-CR-134949-VOL-2-PT-3] 15 p0379 N77-26634
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results [NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment [NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment [NASA-CR-134955] 15 p0380 N77-26637
- Technical review and analysis of the total utility demonstration plant design and operational concept [AD-A037016] 15 p0398 N77-28040
- Hydrogen production and storage in utility systems [BNL-50590] 16 p0515 N77-28600
- Solar energy and electric utilities: Can they be interfaced? [ANL-ES-52] 16 p0515 N77-28601
- FBA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers [PB-265706/2] 16 p0517 N77-28615

The marketability of integrated energy/utility systems  
[PB-266042/1] 16 p0523 N77-29626

Integrated utility systems: Feasibility study and conceptual design at the University of Florida  
[PB-266043/9] 16 p0523 N77-29627

Assessment of energy storage systems suitable for use by electric utilities, volume 3  
[EPRI-EM-264-VOL-3] 16 p0537 N77-31636

Study of electric and gas utilities and the public service commission of Nevada  
[PB-268481/9] 16 p0547 N77-32605

Application of the Alstom/Exxon alkaline fuel cell system to utility power generation  
[EPRI-EM-384] 16 p0557 N77-33643

**UTILITY AIRCRAFT**

The dynamics of STOL /The Daniel and Florence Guggenheim Lecture/ --- utility aircraft for short haul service in remote areas  
[TCAS PAPER 76-01] 13 p0081 A77-19247

**UTILIZATION**

Metal hydrides as hydrogen storage media and their applications  
[BNL-21648] 14 p0231 N77-20589

Survey of the applications of solar thermal energy systems to industrial process heat. Volume 3: Solar thermal energy systems analysis and preliminary assessment of related nontechnical issues  
[TID-27348-VOL-3] 16 p0537 N77-31638

## V

**V GROOVES**

Radiant transmittance of V-corrugated transparent sheets with application to solar collectors  
[ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506

**V/STOL AIRCRAFT**

The competitive market for commercial VSTOL  
[AIAA 77-573] 15 p0290 A77-34933

Variable cycle engines for V/STOL fighters  
15 p0339 N77-22117

**VACUUM DEPOSITION**

Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions  
14 p0162 A77-22978

**VACUUM EFFECTS**

Indoor test methods to determine the effect of vacuum on the performance of a tubular flat plate collector --- for solar energy conversion  
[ASME PAPER 76-WA/SOL-24] 14 p0190 A77-26529

**VACUUM MELTING**

Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels  
[BLL-M-25473-(5828.4F)] 15 p0359 N77-24245

**VACUUM SYSTEMS**

A tubular evacuated solar collector utilizing a heat pipe as absorber  
16 p0417 A77-42961

Use of getters in evacuated solar collectors  
16 p0487 A77-49069

**VACUUM TUBES**

A fixed collector employing reversible vee-trough concentrator and a vacuum tube receiver for high temperature solar energy systems  
13 p0038 A77-12813

**VALUE ENGINEERING**

The quality category in solar engineering  
14 p0143 A77-21310

Payback of solar systems --- cost effectiveness evaluation by dynamic economical model  
16 p0493 A77-49115

**VALVES**

Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base'  
[ASLE PREPRINT 77-AM-2A-1] 15 p0296 A77-35956

**VAPOR DEPOSITION**

Preparation of CdS/InP solar cells by chemical vapor deposition of CdS  
14 p0205 A77-29893

Vapor-phase fabrication of massive structures in space  
[AIAA PAPER 77-542] 15 p0270 A77-32597

High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition  
16 p0408 A77-41741

Investigation of high temperature performance of thin film, solar-thermal energy converters  
[PB-265554/6] 16 p0516 N77-28613

**VAPOR PHASES**

Investigation of gas-controlled heat pipes with reservoirs of constant and variable volume  
13 p0050 A77-14327

Hydrogen production with HOT ELLY --- high temperature vapor phase-electrolysis of water  
15 p0269 A77-32404

**VAPOR PRESSURE**

The test reference year: A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun --- for heating and air conditioning systems design  
16 p0441 A77-48258

Heat-pipe bismuth laser; examination of laser action at 4722 Å in bismuth vapor  
[AD-A039568] 16 p0533 N77-31495

**VAPOR TRAPS**

Reliability study of vapor recovery systems at service stations  
[PB-267613/8] 16 p0560 N77-33700

**VAPORIZING**

Crystallization and vaporization studies on synthetic coal slag compositions  
14 p0140 A77-21228

Coal gasification --- by destructive distillation and coke residue gasification processes  
15 p0262 A77-31471

**VAPORS**

Vapor recovery analysis  
[PB-262846/9] 15 p0368 N77-24667

**VARIABLE CYCLE ENGINES**

Evaluation of propulsive lift enhancement and variable cycle engines for advanced tactical aircraft  
[AIAA PAPER 77-885] 15 p0321 A77-38575

**VARIABLE GEOMETRY STRUCTURES**

Variable geometry for high performance aircraft engines  
13 p0062 A77-17264

Variable Geometry and Multicycle Engines  
[AGARD-CP-205] 15 p0339 N77-22112

Variable geometry in the gas turbine - the variable pitch fan engine  
15 p0339 N77-22128

The pros and cons of variable geometry turbines  
15 p0340 N77-22140

Potential improvements in engine performance using a variable geometry turbine  
15 p0340 N77-22141

Variable flow turbines  
15 p0340 N77-22142

Experience with a one stage variable geometry axial turbine  
15 p0340 N77-22143

**VARIABLE PITCH PROPELLERS**

Variable geometry in the gas turbine - the variable pitch fan engine  
15 p0339 N77-22148

**VARIATIONS**

Regional variations of solar radiation with application to solar energy system design  
[PB-259379/6] 14 p0226 N77-19708

**VEGETATION**

Waste heat vs conventional systems for greenhouse environmental control: An economic assessment  
[ORNL-TN-5069] 13 p0088 N77-10656

**VEGETATION GROWTH**

Fuels from biomass - Energy outlay versus energy returns: A critical appraisal  
15 p0322 A77-38673

Can we control the carbon dioxide in the atmosphere  
15 p0322 A77-38674

Design, operation and economics of the Energy Plantation  
16 p0497 A77-49154

## VELOCITY DISTRIBUTION

## SUBJECT INDEX

## VELOCITY DISTRIBUTION

Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls  
[NASA-TN-D-8396] 14 p0207 N77-16445

**VENTILATION**  
Aerospace and HVAC&R: Spincff '77 - Reaping the dividends --- Heating, Ventilation, Air Conditioning, and Refrigeration 16 p0427 A77-45918  
The solar fan - Solar induced draft air conditioning system 16 p0478 A77-48988

**VERTICAL TAKEOFF AIRCRAFT**  
Energy aspects of VTOL aircraft in comparison with other air and ground vehicles 16 p0419 A77-43333

**VIBRATION DAMPING**  
Emissions from compressor stations --- noise pollution 15 p0287 A77-33545

**VIBRATION EFFECTS**  
Vibration characteristics of a large wind turbine tower on non-rigid foundations  
[NASA-TM-X-73670] 15 p0378 N77-26613

**VIBRATION TESTS**  
Test and evaluation of the Navy half-watt RTG --- Radioisotope Thermoelectric Generator 13 p0042 A77-12853

**VIBRATIONAL SPECTRA**  
Acoustic properties of subsonic MHD channel 13 p0054 A77-15668

**VIKING 1 SPACECRAFT**  
SNAP 19 Viking RTG mission performance 13 p0041 A77-12840

**VIRGINIA**  
Evaluation and targeting of geothermal energy resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642

**VISCOUS FLUIDS**  
Thermal explosion of moving reacting fluids of variable viscosity 13 p0052 A77-14980

**VOLATILITY**  
Coal devolatilization and hydrogasification 14 p0200 A77-29450  
Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers  
[WSS/CI PAPER 76-25] 16 p0419 A77-43593

**VOLCANOES**  
Heat transport in geothermal systems 14 p0174 A77-24203  
Remote sensing of geothermic activities of the volcanoes Aetna, Stromboli and Vesuv by means of infra-red NOAA-VHRR-satellite data --- Italy 13 p0104 N77-12485

**VOLCANOLOGY**  
LANDSAT (ERTS) used as a basis for geological volcanological mapping in the central Andes  
[NASA-TM-75024] 15 p0390 N77-27474

**VOLT-AMPERE CHARACTERISTICS**  
A multilayer iron-thionine photogalvanic cell 13 p0007 A77-11108  
Operation of ITO/Si heterojunction solar cells 13 p0014 A77-11762  
Influence of doped-layer parameters on photoelectric characteristics of silicon photovoltaic cells 13 p0014 A77-11916  
Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies 13 p0018 A77-12361  
Performance and cost analysis of photovoltaic power systems for on-site residential applications 13 p0038 A77-12816  
Study of the electrical characteristics of the boundary layer on the metal surfaces in the channels of an open cycle MHD generator 13 p0054 A77-15666  
Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells 13 p0069 A77-18517  
An analysis of silicon solar cell parameters for terrestrial applications 13 p0076 A77-19081  
Ceramic thin film CdTe solar cell 14 p0135 A77-19635

Curve of current delivered from MHD generator to a conventional power grid by inverter system 14 p0141 A77-21253

Silicon solar cell development 14 p0148 A77-21784

Assessment of high-efficiency solar cells performance 14 p0148 A77-21785

A novel cover slide for solar cells 14 p0148 A77-21789

Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions 14 p0149 A77-21801

Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818

Open-circuit voltage of silicon solar cells 14 p0151 A77-21820

Effect of components on converters --- solar cell array transistor and thyristor performance 14 p0153 A77-21841

High efficiency n-CdS/p-InP solar cells prepared by the close-spaced technique 14 p0156 A77-22081

Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions 14 p0162 A77-22978

Improved theory of the silicon p-n junction solar cell 14 p0166 A77-23364

Thermionic energy conversion technology - Present and future [AIAA PAPER 77-500] 14 p0173 A77-23918

Theoretical and experimental validation of new sources of electrical energy 14 p0176 A77-24457

Design considerations for high-intensity solar cells 14 p0179 A77-25591

Performance limitations of silicon solar cells 15 p0257 A77-30711

Electronic properties of amorphous silicon in solar cell operation 15 p0257 A77-30717

Collection efficiency of heterojunction solar cells 15 p0258 A77-30722

Silicon solar cells on unidirectionally recrystallized metallurgical silicon 15 p0258 A77-30731

Indium-tin-oxide-silicon heterojunction photovoltaic devices 15 p0259 A77-30735

Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells 15 p0259 A77-30736

Large-area high-efficiency AlGa/As-GaAs solar cells 15 p0259 A77-30738

InP-CdS solar cells 15 p0259 A77-30740

High level concentration of sunlight on silicon solar cells 15 p0267 A77-32208

High-efficiency and high-peak-power InP transferred-electron oscillators 15 p0289 A77-34366

The sawtooth coverslide - A new means of coupling light into solar cells 15 p0298 A77-36263

Photovoltaic properties and junction formation in CuInSe<sub>2</sub> 15 p0305 A77-36584

Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765

Axial field limitations in MHD generators 15 p0328 A77-39552

Calculation of end effects in open-cycle MHD power generators 15 p0329 A77-39558

CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567

Upper limit of efficiency for photovoltaic solar cells 16 p0399 A77-40568

The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583

# SUBJECT INDEX

# WASTE ENERGY UTILIZATION

The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface 16 p0414 A77-42634

Hydrogen and electricity from water and light 16 p0430 A77-46609

Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421

On the analysis and design of grid structures for p-n junction solar cells 16 p0497 A77-49156

The dependence of current output of the Ti-Ti SnO<sub>2</sub>/Pt iron-thickine photogalvanic cell on photostationary state composition --- Totally Illuminated, Thin Layer 16 p0502 A77-50220

N-CdS/n-GaAs voltage-enhanced photoanode --- in photoelectrochemical solar cell 16 p0503 A77-50287

Efficient sprayed In<sub>2</sub>O<sub>3</sub>:Sn n-type silicon heterojunction solar cell 16 p0503 A77-50292

**VOLTAGE CONVERTERS (DC TO DC)**  
Use of heat pipes in electronic hardware 16 p0526 A77-30293

**VOLTAGE REGULATORS**  
Linear model of a dissipative PWM shunt regulator --- Pulse Width Modulation 13 p0080 A77-19172

Voltage consolidation and control circuits for multiple-electrode MHD generators 14 p0141 A77-21252

The interaction of batteries and fuel cells with electrical distribution systems - Force commutated converter interface 16 p0414 A77-42635

Exact 60 cycle power generation at any speed --- for windmill applications 16 p0450 A77-48759

**VOLTBATTERS**  
On the nature of fluctuations in an open cycle magnetohydrodynamic generator 13 p0117 A77-13841

**VORTEX GENERATORS**  
Vortex kinetic energy concentrator 13 p0044 A77-12870

**VOYAGER PROJECT**  
Tests and evaluation of multihundred watt thermoelectric generators at JPL 16 p0462 A77-48854

## W

**WAKES**  
Investigation of excitation control for wind-turbine generator stability [NASA-TM-73745] 16 p0535 A77-31614

**WALL FLOW**  
Replenishment processes and flow train interaction --- in MHD generators 14 p0139 A77-21223

Influence of flow nonuniformity on plasma instability at the channel wall 15 p0269 A77-32520

Experimental investigation of multiple-loaded diagonal conducting wall generators 15 p0325 A77-39529

**WALL TEMPERATURE**  
Effects of one-sided heat input and removal on axially grooved heat pipe performance [AIAA PAPER 77-191] 14 p0135 A77-19887

Calculation of thermal stresses in ceramic elements of the refractory channel walls of a magnetohydrodynamic generator 15 p0263 A77-31540

Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers 15 p0330 A77-39564

A non-technical evaluation of four different concrete wall solar collector configurations 16 p0478 A77-48990

Natural convection phenomena in inclined cells with finite side-walls - A numerical solution --- solar energy absorption cells 16 p0500 A77-50201

**WANKEL ENGINES**  
Whatever happened to the Wankel engine 15 p0272 A77-33125

Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 A77-26134

**WASHING**  
Evaluation of molten scrubbing for fine particulate control [PB-266092/6] 16 p0517 A77-28642

**WASTE DISPOSAL**  
Energy from wastes 13 p0006 A77-11038

Controlled tipping of combustion residues 13 p0008 A77-11175

Dutchess County, NY moves towards pyrolysis --- of solid wastes with fuel recovery 13 p0010 A77-11298

Operation of the Westinghouse Coal Gasification Process Development Unit 13 p0023 A77-12689

Energy and environment post-2000 13 p0050 A77-14560

An analysis of the role of energy in solid waste utilization and disposal 14 p0182 A77-26070

Sewage sludge treatment and disposal --- Book 15 p0298 A77-36127

Disposal of toxic wastes. I - Electroplating and electrochemical machining wastes. II - Poisonous and radioactive wastes 15 p0305 A77-36608

Energy recovery by the incineration of solid waste - Development, present status and experiences in Germany 15 p0334 A77-39675

'Co-disposal' for solid wastes and sewage sludge 16 p0427 A77-45873

Fluidized-bed incineration of waste materials 16 p0434 A77-47216

Modern incineration - A proven way for recovery of energy and metals 16 p0434 A77-47220

Steam recovery - An alternative for intermediate size regions --- solid waste disposal 16 p0434 A77-47222

Pollution control in geothermal energy 16 p0452 A77-48772

Resource recovery technology for urban decision-makers [PB-252458/5] 13 p0093 A77-10964

Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges [PB-256691/7] 13 p0133 A77-15540

Fine shredding of municipal solid waste [PB-257105/7] 13 p0133 A77-15919

Fuel and energy production by bioconversion of waste materials: State-of-the-art [PB-258499/3] 14 p0219 A77-19279

Control of waste and water pollution from power plant flue gas cleaning systems [PB-259211/1] 14 p0227 A77-19953

Waste POL disposal through energy recovery [AD-A031783] 14 p0235 A77-20957

Contamination of groundwater by heavy metals from the land disposal of fly ash [COO-2727-4] 15 p0357 A77-23631

The potential for reusable homogeneous containers [PB-265100/8] 16 p0518 A77-29007

Physical properties of western coal waste materials [PB-266724/4] 16 p0530 A77-30657

Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation [PB-268232/6] 16 p0542 A77-32051

Thermodynamic analysis of an oil reclamation process [PB-268524/6] 16 p0548 A77-32619

Preliminary design study of a baseline MHD [NASA-TM-X-58193] 16 p0561 A77-34050

Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment [PB-269270/5] 16 p0561 A77-34058

**WASTE ENERGY UTILIZATION**  
Energy from solid wastes --- Book 13 p0003 A77-10698

Energy from wastes 13 p0006 A77-11038

Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system 13 p0020 A77-12665

A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673

Steam station repowering - A near-term method of energy conservation 13 p0022 A77-12679

Thermionic topping for central station power plants 13 p0034 A77-12787

PULSAR, an unconventional topping stage --- MHD generation with metallic armature produced magnetic flux compression 13 p0034 A77-12788

Thermionic topping of a steam power plant 13 p0034 A77-12789

Energy recovery in railway and road transportation 13 p0051 A77-14564

Improved use of energy --- through waste and solar energy utilization 13 p0079 A77-19123

Influence of coal type and drying upon MHD power plants and components 14 p0140 A77-21231

Applications of the rapid devolatilization of coal in MHD power cycles 14 p0141 A77-21249

Wide-range control of a thermal interconnection network --- waste incineration utilization supplying pipelined steam heat 14 p0145 A77-21545

On the production of town gas from off-gases of the chemical processing industry 14 p0164 A77-23099

Utilization of heat of geothermal springs and waste hot waters in freon-operated power plants 14 p0175 A77-24207

Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors 14 p0175 A77-24210

Design studies of the hydrogasification of coal 14 p0175 A77-24214

Drying of refuse-derived fuel for energy recovery from municipal solid waste 14 p0182 A77-26071

A method for increasing the efficiency of the electric generating process 14 p0183 A77-26087

Design considerations for heat recovery system for DD-963 class ship [ASME PAPER 77-GT-106] 14 p0197 A77-28616

Efficient energy utilization 15 p0264 A77-31578

Hydrogen production from nuclear waste energy 15 p0274 A77-33331

The outlook for more efficient fuel utilization in generation of process heat 15 p0294 A77-35400

Energy recovery from municipal and industrial waste 15 p0305 A77-36605

Energy recovery by the incineration of solid waste - Development, present status and experiences in Germany 15 p0334 A77-39675

California's aqueduct offers peaking power to Los Angeles 16 p0400 A77-40893

Investigation into the use of large-scale total-energy systems in mild and warm climates 16 p0401 A77-41318

Thermal storage for electric utilities [AIAA 77-1009] 16 p0403 A77-41556

Energy conservation by symbiosis 16 p0408 A77-41852

Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26] 16 p0432 A77-46909

Steam recovery - An alternative for intermediate size regions --- solid waste disposal 16 p0434 A77-47222

Sludge processing to optimize digestibility and energy production 16 p0439 A77-48100

Biphase turbines for diesel bottoming --- waste heat recovery 16 p0449 A77-48755

Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications 16 p0450 A77-48756

Heat pipes for hostile environments in energy conservation applications 16 p0450 A77-48758

Development status - Binary Rankine cycle waste heat recovery system 16 p0459 A77-48828

600 kW Organic Rankine Cycle Waste Heat Power Conversion System 16 p0459 A77-48829

Combined diesel-organic Rankine-cycle power plant 16 p0459 A77-48830

Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831

Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors [INIS-HP-1965] 13 p0084 A77-10228

Waste heat vs conventional systems for greenhouse environmental control: An economic assessment [ORNL-TM-5069] 13 p0088 A77-10656

Selected aspects of waste heat management [PB-254401/3] 13 p0109 A77-12568

Performance characteristics of a diesel engine using low- and medium-energy gases as a fuel supplement (fumigation) [NASA-TM-X-58188] 13 p0126 A77-14955

Technical and economic feasibility of US district heating systems using waste heat from fusion reactors [BNL-50516] 14 p0232 A77-20606

Waste POL disposal through energy recovery [AD-A031783] 14 p0235 A77-20957

Rankine cycle energy conversion system design considerations for low and intermediate temperature sensible heat sources [SAND-76-0363] 14 p0251 A77-21699

Energy recovery from solid waste: A review of current technology [PB-260633/3] 14 p0253 A77-22016

Solid waste as an energy source for the northeast [BNL-50559] 15 p0352 A77-23012

Procedures for feasibility analysis and preliminary design of total energy systems at military facilities [AD-A033756] 15 p0356 A77-23614

Energy recovery through biogasification of municipal solid wastes and utilization of thermal wastes from an energy-urban-agro-waste complex 15 p0358 A77-24008

Technical review and analysis of the total utility demonstration plant design and operational concept [AD-A037016] 15 p0398 A77-28040

Demonstration of building heating with a heat pump using thermal effluent [AD-A041024] 16 p0530 A77-30631

Preliminary design study of a baseline MHD [NASA-TM-X-58193] 16 p0561 A77-34050

**WASTE UTILIZATION**

Dutchess County, NY moves towards pyrolysis --- of solid wastes with fuel recovery 13 p0010 A77-11298

The solution of the garbage problem: New proposals for the utilization of refuse - Proposals and suggestions --- materials recycling and energy production facilities 13 p0015 A77-12061

Nuclear power for the production of synthetic fuels and feedstocks 13 p0035 A77-12790

Fuel gas recovery from controlled landfilling of municipal wastes 13 p0070 A77-18739

Demonstration of pyrolysis and materials recovery in San Diego, California 14 p0137 A77-20521

Utilization of disposed petroleum products and industrial wastes as fuels 14 p0167 A77-23404

# SUBJECT INDEX

# WASTE WATER

An analysis of the role of energy in solid waste utilization and disposal 14 p0182 A77-26070

New life for old garbage - Resource and energy recovery from solid wastes 14 p0199 A77-29096

Energy from wastes 15 p0272 A77-33280

Solid waste incineration and energy recovery in hospitals 15 p0272 A77-33283

Municipal solid waste recovery - A public or private risk 15 p0273 A77-33299

Energy from wood wastes 15 p0273 A77-33301

Waste economy and recycling: Problems and practice --- German book 15 p0273 A77-33303

Recovering metal from trash 15 p0287 A77-33529

Use of municipal waste for fuel 15 p0291 A77-35149

Refuse to energy Memphis style 15 p0292 A77-35156

Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157

Recovering resources from urban refuse by the Bureau of Mines processes 15 p0292 A77-35158

Energy recovery from solid waste using the Union Carbide Purox system 15 p0292 A77-35159

Energy recovery from low heating value industrial waste 15 p0292 A77-35160

China claims lead in biogas energy supply 15 p0297 A77-36050

Sewage sludge treatment and disposal --- Book 15 p0298 A77-36127

Decision making in the utilisation of the organic fraction of municipal wastes 15 p0299 A77-36272

Economic feasibility of the conversion of organic waste to fuel oil and pipeline gas 15 p0302 A77-36346

Regional energy availability from conversion of solid waste 15 p0304 A77-36433

Energy recovery from municipal and industrial waste 15 p0305 A77-36605

EPA resource recovery demonstration - Summary of air emissions analyses 15 p0313 A77-37630

Clean fuels from biomass, sewage, urban refuse, agricultural wastes; Proceedings of the Symposium, Orlando, Fla., January 27-30, 1976 15 p0313 A77-37652

Wastes and biomass as energy resources - An overview 15 p0313 A77-37654

Municipal solid waste as a resource for energy recovery and conservation 15 p0313 A77-37655

Union Electric Company's 8000 ton per day solid waste utilization system 15 p0313 A77-37656

Resource recovery and flash pyrolysis of municipal refuse 15 p0313 A77-37657

Fuel gas and electricity from municipal sewage 15 p0314 A77-37658

SNF from refuse and sewage sludge by the BIOGAS process 15 p0314 A77-37659

Fuel gas from landfill 15 p0314 A77-37661

EPA's program in environmental research in wastes-as-fuel 15 p0315 A77-37668

Environmental studies of the St. Louis-Union Electric refuse firing demonstration 15 p0315 A77-37669

Federal Fuels from Biomass Energy Program 15 p0315 A77-37670

The PUROX System --- solid waste partial oxidation to fuel gas 15 p0315 A77-37671

Large scale hydrogen production utilizing carbon in renewable resources 15 p0321 A77-38527

Producer gas from agricultural wastes - Its production and utilization in a converted oil-fired boiler 15 p0323 A77-39106

Energy from bioconversion of waste materials --- Book 16 p0407 A77-41649

Photosynthetic solar energy - Rediscovering biomass fuels 16 p0421 A77-44396

Acid mine drainage - The problem and the solution 16 p0425 A77-45125

Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations --- Book 16 p0428 A77-46250

Waste resources - Problems and promise --- for urban energy conversion [ASME PAPER 77-ENAS-49] 16 p0432 A77-46890

Energy from solid waste utilization; Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, University of Rhode Island, Kingston, R.I., July 8, 9, 1975 16 p0433 A77-47210

Economics of solid waste conversion 16 p0433 A77-47211

Potential alternative fuel derivatives from municipal solid wastes 16 p0433 A77-47213

A supplementary fuel for power generation /Ames, Iowa/ --- solid waste recovery system 16 p0433 A77-47214

Energy and resource recovery from solid wastes 16 p0434 A77-47215

Methane production from solid waste 16 p0434 A77-47218

Thermal processing of municipal solid waste for resource and energy recovery --- Book 16 p0438 A77-47951

The solid-fuel gas turbine for industrial energy production 16 p0453 A77-48785

Fluidized-bed combustion of anthracite refuse 16 p0454 A77-48793

Recent Canadian activities in biomass 16 p0470 A77-48917

Agricultural and forestry wastes as an energy resource 16 p0489 A77-49083

Eliminate source emission codes for coal-refuse fired power plants 16 p0504 A77-51128

Recycling trends in the United States: A review [PB-254222/3] 13 p0085 N77-10391

Environmental effects of solid waste as a supplemental fuel [IS-3852] 14 p0211 N77-17567

Study of the feasibility of a regional solid waste derived fuel system in the Tennessee Valley Authority service area [PB-259764/9] 14 p0227 N77-19956

Clean fuels from agricultural and forestry wastes [PB-259956/1] 14 p0233 N77-20610

Bioconversion of agricultural wastes for pollution control and energy conservation [TID-27164] 15 p0383 N77-26675

An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components [PB-267629/4] 16 p0531 N77-31046

**WASTE WATER**

Fuel gas and electricity from municipal sewage 15 p0314 A77-37658

'Co-disposal' for solid wastes and sewage sludge 16 p0427 A77-45873

Anaerobic sludge digestion - A potential energy source 16 p0439 A77-47970

Sludge processing to optimize digestibility and energy production 16 p0439 A77-48100

## WATER

## SUBJECT INDEX

- Selected aspects of waste heat management: A  
state-of-the-art study  
[PB-255697/5] 13 p0100 N77-11563
- Heat transportation by hot water pipe-lines at 90  
deg C  
[AD-A038301] 16 p0512 N77-28453
- Developing and testing of a wastewater recycler  
and heater  
[NASA-CR-154846] 16 p0531 N77-31040
- WATER**
- Photoassisted electrolysis of water - Conversion  
of optical to chemical energy  
13 p0021 A77-12666
- Hydrogen from solar energy via water electrolysis  
13 p0032 A77-12771
- Stage efficiency in the analysis of thermochemical  
water decomposition processes  
13 p0047 A77-13538
- Hydrogen production using solar radiation  
13 p0048 A77-13540
- Hydrogen production from water by means of  
chemical cycles  
13 p0058 A77-16471
- Water induction in hydrogen-powered IC engines  
14 p0171 A77-23721
- Thermochemical hydrogen production via a cycle  
using barium and sulfur - Reaction between  
barium sulfide and water  
15 p0321 A77-38529
- Synthetic carbonaceous fuel and feedstock using  
nuclear power, air and water  
15 p0321 A77-38532
- Heat pumps in solar installations  
15 p0337 A77-39987
- The effect of dropwise condensation on glass solar  
properties  
16 p0422 A77-44485
- Hydrogen and oxygen from water  
16 p0430 A77-46573
- Development of a sulfur-iodine thermochemical  
water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- Thermal energy storage by the sulfuric acid-water  
system  
16 p0492 A77-49108
- Feasibility of heating domestic hot water for  
apartments with solar energy  
[AD-A028418] 14 p0209 N77-16461
- Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur families  
14 p0238 N77-21572
- Thermodynamics of thermochemical water  
decomposition processes  
14 p0238 N77-21574
- Discovery of reaction sequences for thermochemical  
water splitting  
14 p0238 N77-21575
- Effective conversion processes between thermal and  
chemical energies: Thermodynamic study of  
multistep water decomposition processes  
14 p0238 N77-21576
- The Westinghouse sulfur cycle for the  
thermochemical decomposition of water  
14 p0238 N77-21587
- Hydrogen production by water decomposition using a  
combined electrolytic thermochemical cycle  
14 p0238 N77-21589
- Geothermal water and gas: Collected methods for  
sampling and analysis: Comment issue  
[BNWL-2094] 14 p0249 N77-21679
- Hydrogen storage, water electrolysis and fuel  
cells for electric energy storage  
[BNL-21498] 15 p0344 N77-22620
- Progress report on the performance of three  
Australian solar hot water systems  
[SES-8] 15 p0364 N77-24604
- United States special format report: Performance  
of the Sohio Solar Water Heating System using  
large area plastic collectors (Grants, New Mexico)  
[SAN/1038-76/1] 15 p0365 N77-24606
- Hydration-dehydration cycling of MgO-Mg(OH)2 for  
application to solar heat storage systems  
[AI-ERDA-13178] 15 p0381 N77-26654
- Space power technology applied to the energy problem  
16 p0526 N77-30294
- Market evaluation study: Solar heating and  
domestic hot water heating in DoD buildings  
[AD-A042178] 16 p0546 N77-32597
- A finite element model for the analysis of  
waterflood performance  
[STP71-A75036] 16 p0551 N77-33464
- WATER CIRCULATION**
- Water power in the immediate future  
13 p0056 A77-15850
- WATER CONSUMPTION**
- Water requirements for an integrated SNG plant and  
mine operation  
13 p0060 A77-16651
- MHD systems with low cooling requirements  
15 p0332 A77-39575
- Water requirements for steam-electric power  
generation and synthetic fuel plants in the  
western United States  
[PB-268067/7] 16 p0540 N77-31667
- WATER FLOW**
- California's aqueduct offers peaking power to Los  
Angeles  
16 p0400 A77-40893
- A heat transfer criterion on the geometric  
configuration of flat solar water heaters  
16 p0472 A77-48944
- On pressure-work, viscous dissipation and the  
energy balance relation for geothermal reservoirs  
16 p0505 A77-51256
- A comparison between experimental and numerical  
investigations of the motion of the water  
surface in a model surge tank  
16 p0505 A77-51257
- Engineering analysis and testing of water-trickle  
solar collector  
[ORO-4927-76-2] 15 p0391 N77-27506
- WATER INJECTION**
- Recovery of heat energy from deep or shallow  
aquifers  
14 p0175 A77-24206
- A hydrogen-powered mass transit system  
15 p0282 A77-33400
- Water induction in hydrogen-powered IC engines  
14 p0243 N77-21631
- WATER MANAGEMENT**
- Water and energy systems - A planning model  
16 p0506 A77-51279
- Analysis of information systems for hydropower  
operations: Executive summary  
[NASA-CR-149342] 13 p0122 N77-14586
- Analysis of information systems for hydropower  
operations  
[NASA-CR-149373] 13 p0129 N77-15497
- WATER POLLUTION**
- Effects of coal mining on ground and surface water  
quality, Monongalia County, West Virginia  
16 p0400 A77-41211
- Electrobiological neutralization of acid mine water  
16 p0420 A77-43651
- Being prepared for future Argo Merchants ---  
tanker oil spill prevention  
16 p0425 A77-45228
- The ecology of a marine littoral receiving  
effluents from a petroleum refinery  
16 p0433 A77-47173
- A characterization of the sources of petroleum  
hydrocarbons in Lake Washington  
16 p0439 A77-48099
- Pollution control in geothermal energy  
16 p0452 A77-48772
- Physical and biological aspects of thermal  
pollution in sea water --- forecasting electric  
power production in Italy  
[ISS-L-75/14] 13 p0109 N77-12560
- Assessment of the impact of proposed thermal  
effluent guidelines for the steam electric power  
industry  
[PB-255937/5] 13 p0110 N77-12587
- Characterization and evaluation of wastewater  
sources United States Steel Corporation,  
Clairton Works, Pittsburgh, Pennsylvania, 28-J1  
January 1976  
[PB-255586/0] 13 p0116 N77-13566
- Evaluation of pollution control in fossil fuel  
conversion processes  
[PB-255842/7] 13 p0125 N77-14638
- JP-4 and JP-9 fuel toxicity studies using water  
fish and aufwuchs  
[AD-A027594] 13 p0127 N77-15213



# SUBJECT INDEX

# WATER TREATMENT

- Proceedings of National Conference on Health,  
Environmental Effects, and Control Technology of  
Energy Use 14 p0208 N77-16453
- [PB-256445/9]
- Control of waste and water pollution from power  
plant flue gas cleaning systems 14 p0227 N77-19953
- [PB-259211/1]
- Economics of a freeze desalting process using cold  
seawater effluent of a liquid natural gas plant 14 p0234 N77-20656
- [PB-259272/3]
- Thermal effects on biodegradation of pollutants in  
water 15 p0350 N77-22709
- [PB-261512/8]
- Contamination of groundwater by heavy metals from  
the land disposal of fly ash 15 p0357 N77-23631
- [COO-2727-4]
- Research and development assessment on safety and  
pollution control for outer continental shelf  
operations 15 p0357 N77-23635
- [AD-A034727]
- In-situ coal gasification: Status of technology  
and environment impact 16 p0548 N77-32613
- [PB-268576/6]
- WATER PRESSURE**
- A pressurized liquid concept for solar-thermal  
energy storage for the 24-hour continuous  
operation of an energy conversion system 14 p0187 A77-26484
- [ASME PAPER 76-WA/HT-38]
- WATER QUALITY**
- Utilization of remote sensing techniques to detect  
land use effects on wildland water quality 13 p0071 A77-18984
- Strategy of pollution control --- Book 16 p0400 A77-40673
- Effects of coal mining on ground and surface water  
quality, Monongalia County, West Virginia 16 p0400 A77-41211
- WATER RECLAMATION**
- Feasibility study of a nuclear power-sewage  
treatment system for the conservation and  
reclamation of water resources 13 p0126 N77-14960
- [PB-255630/6]
- Developing and testing of a wastewater recycler  
and heater 16 p0531 N77-31040
- [NASA-CR-154846]
- WATER RESOURCES**
- Solar water pump for lift irrigation 13 p0019 A77-12406
- The nature and characteristics of the distribution  
of helium and argon isotopes in the geothermal  
waters of the Kuril Islands and Kamchatka 13 p0048 A77-13589
- Analysis of information systems for hydropower  
operations: Executive summary 13 p0122 N77-14586
- [NASA-CR-149342]
- Utility distribution systems in Iceland 13 p0126 N77-14957
- [AD-A026556]
- Mathematical models for use in planning regional  
water resources and energy systems 15 p0352 N77-23022
- [PB-261364/4]
- Energy technologies for the West: Possible  
effects of Energy Technology on Land, Water, and  
Air Resources 16 p0556 N77-33632
- [TID-27444]
- WATER TEMPERATURE**
- Making electricity from moderate temperature fluids  
--- geothermal sources 13 p0002 A77-10649
- The solar water heater industry in South Florida -  
History and projections 13 p0018 A77-12403
- A forced circulation system for solar water heating 13 p0019 A77-12413
- Underground storage of off-peak power 13 p0027 A77-12728
- Power production from high temperature geothermal  
waters 13 p0030 A77-12751
- The utilization and economics of low temperature  
geothermal water for space heating 13 p0030 A77-12756
- Solar water heater using hardened black polythene  
pipe absorbers 13 p0073 A77-19060
- Design and performance of thermal storage water tank 13 p0075 A77-19079
- Selection of optimal pan color for solar water  
heater 13 p0078 A77-19104
- Flow in geothermal hot water wells 14 p0163 A77-23037
- Interaction of hot water reservoirs and deep wells 14 p0163 A77-23038
- 'Low-energy' geothermal heat 14 p0178 A77-25001
- Storage tanks - A numerical experiment --- for  
solar heating 14 p0180 A77-25898
- An experimental and analytical investigation of a  
solar water heater [ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- Principles and systems for utilization of solar  
energy in heating and preparation of hot water 15 p0255 A77-30257
- Economy of tap water heating in summer by means of  
solar energy 15 p0261 A77-31374
- Optimal tap water heating 15 p0261 A77-31375
- Solar cooling of a Florida welcome station - A  
demonstration 15 p0294 A77-35319
- Calculation and optimization of solar-energy  
systems which provide hot water 15 p0337 A77-39988
- The BBC Solarwatt system --- for domestic hot  
water supply 15 p0337 A77-39989
- Domestic hot water and solar energy in Ireland 16 p0430 A77-46608
- Predicting the rate of warming of rivers below  
hydroelectric installations 16 p0437 A77-47749
- Effect of reservoir temperature decline on  
geothermal power plant design and economics 16 p0456 A77-48805
- Design and construction of solar space heating and  
hot water supply systems for experimental  
multi-family housing 16 p0477 A77-48979
- Project Sunshower - San Jose State University  
dormitory retrofit to solar-assisted water heating 16 p0479 A77-48996
- Experimental study of the subsurface transport of  
water and heat as related to the storage of  
solar energy 16 p0493 A77-49112
- An experimental investigation with artificial  
sunlight of a solar hot-water heater 16 p0498 A77-49163
- Measured performance of a 3-ton LiBr absorption  
water chiller and its effect on cooling system  
operation 16 p0498 A77-49165
- Intermediate minimum property standards for solar  
heating and domestic hot water systems [PB-257086/9] 13 p0132 N77-15525
- Analysis of thermal performance of Solaris  
water-trickle solar collector 15 p0382 N77-26668
- [CONF-761107-17]
- Evaluation of Solaris water-trickle solar  
collector and demonstration of annual cycle  
collection and storage of solar heated water [CONF-761143-1] 15 p0382 N77-26669
- Comparative performance of solar heating with air  
liquid systems 15 p0383 N77-26676
- [COO-2868-1]
- Economic analysis of solar water and space heating  
[DSE/2322-1-SUPPL] 16 p0536 N77-31627
- WATER TREATMENT**
- Corrosion problems in solar energy systems 15 p0270 A77-32603
- Fuel gas and electricity from municipal sewage 15 p0314 A77-37658
- Electrochemical neutralization of acid mine water 16 p0420 A77-43651
- 'Co-disposal' for solid wastes and sewage sludge 16 p0427 A77-45873
- Anaerobic sludge digestion - A potential energy  
source 16 p0439 A77-47970
- Sludge processing to optimize digestibility and  
energy production 16 p0439 A77-48100
- Selected aspects of waste heat management: A  
state-of-the-art study [PB-255697/5] 13 p0100 N77-11563

# WATER VAPOR

# SUBJECT INDEX

Selected aspects of waste heat management  
[PB-254401/3] 13 p0109 N77-12568

Discovery of reaction sequences for thermochemical water splitting  
[AD-A029959] 14 p0228 N77-20191

Hydrogen generation by photoelectrolysis of water  
14 p0240 N77-21605

Feasibility of hydrogen production by direct water splitting at high temperature  
14 p0240 N77-21606

An investigation of hydrogen production from water at high temperatures  
14 p0240 N77-21607

Developing and testing of a wastewater recycler and heater  
[NASA-CR-154846] 16 p0531 N77-31040

**WATER VAPOR**

Electric energy from atmospheric water vapor  
13 p0077 A77-19097

Hydrogen production with HOT ELLY --- high temperature vapor phase-electrolysis of water  
15 p0269 A77-32404

Energy from humid air  
[AIAA PAPER 77-730] 15 p0311 A77-37253

Geothermal energy - Tapping nature's boiler room  
16 p0437 A77-47600

Hydrogen production from water utilizing solar heat at high temperatures  
16 p0501 A77-50205

**WATER WAVES**

Hydrodynamic basis of wave-energy converters of channel form  
15 p0267 A77-32211

**WATERWAVE ENERGY**

Power resource estimate of ocean surface waves  
13 p0071 A77-18790

**WATERWAVE ENERGY CONVERSION**

The atmosphere and the oceans as energy sources  
13 p0005 A77-11036

Harnessing the ocean waves, swells and tides  
14 p0183 A77-26091

Energy from the oceans - Requirements and capabilities  
15 p0272 A77-33141

Sea water - The energy elixir --- ocean thermal, tide and wave energy conversion  
15 p0320 A77-38446

The oceans as a source of electricity  
16 p0412 A77-42401

Wave power --- potentially available in New Zealand  
16 p0418 A77-43011

Ocean wave power  
16 p0499 A77-49349

**WAVE DIFFRACTION**

On the theory and solar application of inductive grids --- wave diffraction modeling and far IR measurement  
16 p0419 A77-43556

**WAVE REFLECTION**

Optical study of fixed spherical solar collectors  
16 p0505 A77-51161

**WAVEGUIDE FILTERS**

Waveguide high pass filter for thermal conversion of solar energy  
13 p0073 A77-19054

**WEAR INHIBITORS**

Antiwear additives, wear studies on chemical addition agents for imparting an effective lubricating response in polysiloxane (silicone) fluids  
[AD-A033527] 15 p0340 N77-22270

**WEATHER**

Weather, climate and human settlements  
[WMO-448] 15 p0387 N77-27038

**WEATHER MODIFICATION**

Introductory remarks on space observations of long-term climatic changes produced by escalating energy use  
[IAF PAPER A-77-01] 16 p0507 A77-51508

**WEATHER STATIONS**

Insolation data for solar energy conversion derived from satellite measurements of earth radiance  
16 p0471 A77-48930

**WEATHERING**

Weatherability of solar energy utilization materials: Preliminary discussions  
[CONF-76C821-11] 14 p0225 N77-19650

**WEATHERPROOFING**

The weatherability of solar energy utilization materials - Preliminary discussions  
16 p0487 A77-49070

**WEIGHT REDUCTION**

Estimating procedures associated with aircraft modifications  
[SAWE PAPER 1101] 13 p0016 A77-12181

Theoretical aspects of optimization of aviation gas turbine engine design variables  
13 p0063 A77-17762

Air Force applications of lightweight superconducting machinery  
14 p0144 A77-21360

Composite technology - The boom is under way --- rotorcraft materials  
15 p0287 A77-33616

Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications  
16 p0483 A77-49011

**WEIGHTLESSNESS**

Industrial development in zero-G  
15 p0295 A77-35812

A zero g variable conductance heat pipe using bubble pump injection  
[AIAA PAPER 77-752] 15 p0311 A77-37265

**WELD STRENGTH**

Ship steel weldments for low temperature service  
[PB-256997/8] 13 p0103 N77-12203

**WELDED STRUCTURES**

Development and testing of solar water-heating boilers manufactured by diffusion welding  
15 p0316 A77-37773

Development and testing of solar water-heater boilers fabricated by diffusion welding  
16 p0437 A77-47429

**WELDING**

Energy conditions of welding with solar radiation  
16 p0421 A77-44274

Studies of technological processes by solar energy under cosmic simulated conditions  
[IAF PAPER 77-54] 16 p0506 A77-51411

**WELLS**

Pressure drawdown and buildup analyses in geothermal reservoirs  
13 p0030 A77-12753

Problems related to operating thermal wells subject to scaling in Hungary  
14 p0163 A77-23035

Flow in geothermal hot water wells  
14 p0163 A77-23037

Interaction of hot water reservoirs and deep wells  
14 p0163 A77-23038

Recovery of heat energy from deep or shallow aquifers  
14 p0175 A77-24206

Some aspects of heat and mass transfer in geothermal wells  
14 p0175 A77-24209

Fracturing oil shale for in situ retorting experiments  
14 p0193 A77-27341

Underground coal gasification - A status report  
16 p0441 A77-48473

Geothermal well stimulation with a secondary fluid  
16 p0454 A77-48795

Workshop on Geothermal Reservoir Engineering  
[PB-261319/8] 14 p0251 N77-21709

Geothermal down-well pumping system  
[PB-261857/7] 14 p0252 N77-21732

Geothermal hot water pump, appendix  
[PB-262030/0] 15 p0347 N77-22652

Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application  
[PB-262372/6] 15 p0347 N77-22654

The Hawaii geothermal project, initial phase 2 progress report  
[PB-263120/8] 15 p0355 N77-23594

**WESTAR SATELLITES**

Satellite communications for off-shore oil operations using WESTAR  
13 p0053 A77-15130

**WETTING**

Wetting and surface properties of refrigerants to be used in heat pipes --- surface tension and wall contact angles  
13 p0119 N77-14386

# SUBJECT INDEX

# WINDMILLS (WINDPOWERED MACHINES)

**WHEAT**  
Interpretation of Pennsylvania agricultural land use from EHTS-1 data [B77-10111] 14 p0215 N77-18525

**WICKS**  
Investigation of the thermophysical characteristics of low-temperature heat pipes with metal-fiber wicks 13 p0050 A77-14321  
Structural heat conductivity of fiber metal wicks for heat pipes 13 p0050 A77-14326  
Investigation of the effective heat conductivity of metal-fiber wicks for low-temperature heat pipes 16 p0500 A77-49988  
Computer program grade 2 for the design and analysis of heat-pipe wicks [NASA-CR-137954] 13 p0118 N77-14375  
Extended cryogenic performance of Lobar Wick heat pipe/radiator 13 p0119 N77-14379

**WILDERNESS**  
Utilization of remote sensing techniques to detect land use effects on wildland water quality 13 p0071 A77-18984

**WIND (METEOROLOGY)**  
Status of the ERDA/Sandia 17-metre Darrieus turbine design [SAND-76-5683] 14 p0217 N77-18576  
International Symposium on Wind Energy Systems [AD-A034871] 15 p0366 N77-24627  
Study of Alaskan wind power and its possible applications [NSF/RANN/SE/AER74-00239/PR-26] 15 p0382 N77-26664

**WIND DIRECTION**  
Distribution of some hydrocarbons in ambient air near Delft and the influence on the formation of secondary air pollutants 15 p0271 A77-32954

**WIND EFFECTS**  
The wind and its effect on the heating requirements 13 p0009 A77-11266  
Reduced drag, paraboloid type, solar energy collectors 16 p0473 A77-48951

**WIND MEASUREMENT**  
Wind power studies: Field measurement priorities for numerical analysis of wind energy [UCRL-50034-76-3] 14 p0249 N77-21681

**WIND PRESSURE**  
Wind power studies: Regional wind energy measurements [UCRL-50034-76-4] 15 p0392 N77-27527

**WIND PROFILES**  
Siting of wind driven apparatus 13 p0043 A77-12865  
The use of built form to enhance the output of wind collectors --- building design for wind concentration 16 p0490 A77-49090  
Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 KW wind turbine tower [NASA-TM-X-73548] 13 p0114 N77-13534

**WIND TUNNEL TESTS**  
Wind tunnel investigation of devices to reduce bus aerodynamic drag [AIAA PAPER 77-307] 13 p0066 A77-18232  
Comparative wind tunnel investigation of sail profiles for windmills [VTH-191] 13 p0111 N77-13012  
Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 KW wind turbine tower [NASA-TM-X-73548] 13 p0114 N77-13534  
Wind tunnel performance data for the Darrieus wind turbine with NACA 0012 blades [SAND-76-0130] 14 p0214 N77-18057

**WIND TUNNELS**  
Study of the application of solar chemical dehumidification system to wind tunnel facilities of NASA Lewis Research Center at Cleveland, Ohio [NASA-CR-149886] 14 p0227 N77-20116

**WIND VARIATIONS**  
Wind structure in strong winds below 150 m 16 p0410 A77-42071  
Effects of wind fluctuations on windmill behaviour 16 p0410 A77-42073

**WIND VELOCITY**  
Estimating wind power feasibility 13 p0010 A77-11315  
A new generation scheme for large wind energy conversion systems 13 p0043 A77-12868  
Wind driven field modulated generator systems 13 p0044 A77-12869  
New England wind power...coastal or mountain 13 p0058 A77-16250  
Aspects of surface wind behaviour 14 p0165 A77-23357  
Energy content of winds in the high plains region of southwestern U.S. 16 p0490 A77-49089

**WIND VELOCITY MEASUREMENT**  
On the energy pattern factor in wind measurements --- power source potential 15 p0322 A77-38788

**WINDING**  
Thermal performance of the rotor of the MIT-EPRI 3 MVA superconducting alternator --- cryogenic cooling 14 p0144 A77-21384  
The turbo-generator with superconducting field winding in transient operation [BLL-BTS-10351] 15 p0360 N77-24381

**WINDMILLS (WINDPOWERED MACHINES)**  
Windmills stage a comeback --- review 13 p0048 A77-13624  
Dual optimum aerodynamic design for a conventional windmill 13 p0048 A77-13704  
Wind-power generation on a large scale - A design idea 13 p0050 A77-14531  
Aerodynamics of the Darrieus rotor 13 p0050 A77-14559  
Possibilities for utilizing wind energy 13 p0056 A77-15853  
Windmills change direction --- British system utilizing offshore windmills and depleted North Sea fields 13 p0060 A77-16620  
Potential aerodynamic analysis of horizontal-axis windmills [AIAA PAPER 77-132] 14 p0135 A77-19848  
Wind energy for human needs 14 p0145 A77-21400  
Optimum wind-energy conversion systems 14 p0155 A77-21936  
Balancing power supply from wind energy converting systems 14 p0166 A77-23361  
Flap-augmented shrouds for aerogenerators 14 p0183 A77-26085  
Windmill optimization 14 p0183 A77-26086  
Aerodynamic design of a conventional windmill using numerical optimization 14 p0199 A77-29070  
Wind energy in practical use: Wheels, rotors, mills, wind power plants --- German book 15 p0271 A77-33114  
A theory and experimental investigation of ducted wind turbines 16 p0410 A77-42072  
Effects of wind fluctuations on windmill behaviour 16 p0410 A77-42073  
The 'wind-wall' - An integrated wind/solar system 16 p0410 A77-42075  
Economic competitiveness of windmills 16 p0417 A77-42898  
Wind energy - Bounty in the breeze 16 p0418 A77-43123  
The effect of aerofoil characteristics on windmill performance 16 p0438 A77-47880  
Exact 60 cycle power generation at any speed --- for windmill applications 16 p0450 A77-48759  
Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills 16 p0467 A77-48896  
The use of built form to enhance the output of wind collectors --- building design for wind concentration 16 p0490 A77-49090

- Some dynamic problems of rotating windmill systems  
13 p0084 N77-10271
- Comparative wind tunnel investigation of sail  
profiles for windmills  
[VTR-191] 13 p0111 N77-13012
- An estimate of the interaction of a limited array  
of windmills --- feasibility of windpower group  
station for proposed site  
[DM-16] 13 p0114 N77-13539
- Development of a vertical axis wind turbine (phase  
1)  
[BMFT-FB-T-76-55] 14 p0209 N77-17112
- Darrieus Vertical-Axis Wind Turbine program at  
Sandia Laboratories  
[SAND-76-5712] 14 p0223 N77-19616
- Optimization and characteristics of a sailing  
windmill rotor  
[PB-259898/5] 14 p0234 N77-20622
- An analysis of the feasibility of windmills for  
power generation in New York State  
[RPY-TA-17] 15 p0380 N77-26638
- Wind energy: A renewable energy option  
16 p0525 N77-30276
- Wind machines  
[NSF/BA/N-75-051] 16 p0529 N77-30620
- Optimization and characteristics of a sailing  
windmill rotor  
[NSF/RANN/GI-41891/FR/75/4] 16 p0558 N77-33652
- WINDOWS (APERTURES)**
- Windowed versus windowless solar energy cavity  
receivers  
13 p0037 A77-12808
- Window design strategies to conserve energy  
[PB-269297/8] 16 p0559 N77-33669
- WINDPOWER UTILIZATION**
- The atmosphere and the oceans as energy sources  
13 p0005 A77-11036
- The overcoming of energy deficiencies with the aid  
of wind power  
13 p0008 A77-11174
- Energy: A radical redirection  
13 p0010 A77-11275
- Estimating wind power feasibility  
13 p0010 A77-11315
- Production of methane using offshore wind energy  
13 p0026 A77-12722
- Siting of wind driven apparatus  
13 p0043 A77-12865
- A new generation scheme for large wind energy  
conversion systems  
13 p0043 A77-12868
- Operational experience with small wind units  
13 p0044 A77-12873
- An experimental 200 kW vertical axis wind turbine  
for the Magdalen Islands  
13 p0044 A77-12874
- Possibilities for utilizing wind energy  
13 p0056 A77-15853
- Potentialities and limitations of the utilization  
of wind machines  
13 p0061 A77-16787
- Wind energy for human needs  
14 p0145 A77-21400
- Optimum wind-energy conversion systems  
14 p0155 A77-21936
- Direct and indirect economics of wind energy  
systems relative to fuel based systems  
14 p0165 A77-23358
- A possible saturation criterion for wind energy  
extraction  
14 p0165 A77-23359
- Large scale Wind Energy Conversion System /WECS/  
design and installation as affected by site wind  
energy characteristics, grouping arrangement and  
social acceptance  
14 p0165 A77-23360
- Balancing power supply from wind energy converting  
systems  
14 p0166 A77-23361
- Energy from the wind  
14 p0179 A77-25575
- The high potential of wind as an energy source  
14 p0183 A77-26084
- Experience in using bimodal distribution curves to  
evaluate the reliability of systems supplying  
energy from renewable sources --- solar and wind  
systems for radio relay links  
14 p0201 A77-29535
- Wind energy in practical use: Wheels, rotors,  
mills, wind power plants --- German book  
15 p0271 A77-33114
- What price wind power --- wind turbine efficiencies  
15 p0310 A77-37248
- Modeling algorithms and their implementation on a  
digital computer for calculating the capacity of  
storage cells at wind-power and solar energy  
installations  
15 p0316 A77-37775
- On the energy pattern factor in wind measurements  
--- power source potential  
15 p0322 A77-38788
- Study of the feasibility of exploiting the  
galloping phenomenon as energy source  
16 p0407 A77-41722
- Wind structure in strong winds below 150 m  
16 p0410 A77-42071
- Variable speed wind turbines for high wind energy  
conversions  
16 p0410 A77-42074
- Wind energy - Bounty in the breeze  
16 p0418 A77-43123
- Wind power for India  
16 p0423 A77-44498
- Simulation algorithms and their realization by  
digital computer for calculation of wind- and  
solar-plant storage-service capacity  
16 p0437 A77-47431
- Wind energy - Large and small systems competing  
16 p0441 A77-48267
- Wind power - Pipe dream or reality  
16 p0442 A77-48503
- Conversion and storage of wind energy as  
nitrogenous fertilizer  
16 p0450 A77-48762
- Experimental evaluation of a solar/wind-powered  
space heating and hot water heating system in  
the Pacific Northwest  
16 p0462 A77-48849
- Wind-electric conversion utilizing field modulated  
generator systems  
16 p0489 A77-49087
- The application of wind power systems to the  
Minnesota Power and Light Company  
16 p0490 A77-49092
- Description of Provident House, King City, Ontario  
16 p0495 A77-49133
- The updated homesteader  
16 p0495 A77-49136
- Rural energy centre for Africa using solar, wind  
and biogas energies  
16 p0496 A77-49139
- Wind power prediction models  
[NASA-CR-149235] 13 p0105 N77-12509
- Wind energy conversion  
[PB-256198/3] 13 p0115 N77-13552
- Analysis of the technical and cost feasibility of  
solar and/or wind energy systems for Coast Guard  
public quarters  
[AD-A028332] 14 p0209 N77-16460
- Development of a vertical axis wind turbine (phase  
1)  
[BMFT-FB-T-76-55] 14 p0209 N77-17112
- The optimum configuration of rotor blades for  
horizontal wind energy converters  
[NASA-TT-F-17379] 14 p0210 N77-17562
- Application study of wind power technology to the  
city of Hart, Michigan  
[COO-2603-1] 14 p0212 N77-17582
- Investigation of the feasibility of using  
windpower for space heating in colder climates.  
The final design and manufacturing phase of the  
project  
[ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- Evaluation of wind-energy sites from aeolian  
geomorphologic features mapped from LANDSAT  
imagery. First results  
[ERDA/NSF-00598/75/T1] 14 p0218 N77-18667
- Status report: Lawrence Livermore Laboratory wind  
energy studies  
[UCID-17157-1] 14 p0221 N77-19588
- Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility  
[CONP-760906-8] 14 p0222 N77-19609
- Experimental and analytical research on the  
aerodynamics of wind turbines  
[COO-2615-76-T-1] 14 p0223 N77-19613

# SUBJECT INDEX

# WINDPOWERED GENERATORS

- Wind-powered hydrogen electric systems for farm and rural use [PB-259318/4] 14 p0226 N77-19667
- Coupled dynamics analysis of wind energy systems [NASA-CR-135152] 14 p0228 N77-20558
- A wind energy system utilizing high pressure electrolysis as a storage mechanism 14 p0240 N77-21610
- Wind power studies: Field measurement priorities for numerical analysis of wind energy [UCRL-50034-76-3] 14 p0249 N77-21681
- Vertical-axis wind turbine technology workshop [SAND-76-5586] 14 p0250 N77-21688
- Comparison of different wind energy conversion systems. Part 1: The NOAA system compared with the Ulrich HUTTER system [RPP-TRANS-204-PT-1] 15 p0346 N77-22637
- Stochastic modelling of site wind characteristics [PB-261178/8] 15 p0351 N77-22775
- A computer program to calculate and plot wind-generated stored energy at constant consumption [AD-A029977] 15 p0356 N77-23613
- Development and adaptation of field modulated generator systems for wind energy applications [PB-263604/1] 15 p0357 N77-23625
- Barriers to the use of wind energy machines: The present legal/regulatory regime and a preliminary assessment of some legal/political/societal problems [PB-263576/1] 15 p0366 N77-24620
- Vibration characteristics of a large wind turbine tower on non-rigid foundations [NASA-TM-X-73670] 15 p0378 N77-26613
- Evaluation of the potential environmental effects of wind energy system development [ERDA/NSF-07378/75/1] 15 p0382 N77-26663
- Study of Alaskan wind power and its possible applications [NSF/RANN/SE/AER74-00239/PR-26] 15 p0382 N77-26664
- Wind power studies: Regional wind energy measurements [UCRL-50034-76-4] 15 p0392 N77-27527
- Diffuser augmentation of wind turbines [CONF-760842-6] 16 p0521 N77-29610
- Application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine [SAND-75-0284] 16 p0521 N77-29612
- Sandia vertical-axis wind turbine project [SAND-76-0581] 16 p0521 N77-29613
- Wind energy: A renewable energy option 16 p0525 N77-30276
- Dynamic blade loading in the ERDA/NASA 100 kW and 200 kW wind turbines [NASA-TM-73711] 16 p0528 N77-30599
- Wind machines [NSF/RA/N-75-051] 16 p0529 N77-30620
- A non-aerospace application of plans: Preliminary structural design of wind turbine diffuser [RM-629] 16 p0534 N77-31604
- An investigation of peristaltic pumping phenomena with wind energy applications 16 p0545 N77-32586
- Optimization and characteristics of a Sailwing windmill rotor [NSF/RANN/GI-41891/PR/75/4] 16 p0558 N77-33652
- Wind energy conversion [PB-268718/4] 16 p0559 N77-33667
- WINDPOWERED GENERATORS**
- The overcoming of energy deficiencies with the aid of wind power 13 p0008 A77-11174
- Design principles for solar and wind power installations 13 p0015 A77-11922
- Optimization criteria for solar and wind power systems 13 p0015 A77-11923
- Siting of wind driven apparatus 13 p0043 A77-12865
- The consumer's cost of electricity from windmills 13 p0043 A77-12866
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility 13 p0043 A77-12867
- A new generation scheme for large wind energy conversion systems 13 p0043 A77-12868
- Wind driven field modulated generator systems 13 p0044 A77-12869
- Vortex kinetic energy concentrator 13 p0044 A77-12870
- Numerical solution for the unsteady lifting characteristics of variable pitch cross-flow wind turbines 13 p0044 A77-12871
- Design consideration for the Darrieus rotor --- wind turbines 13 p0044 A77-12872
- Operational experience with small wind units 13 p0044 A77-12873
- An experimental 200 kW vertical axis wind turbine for the Magdalen Islands 13 p0044 A77-12874
- Dependability of wind energy generators with short-term energy storage 13 p0046 A77-13323
- Windmills stage a comeback --- review 13 p0048 A77-13624
- Wind-power generation on a large scale - A design idea 13 p0050 A77-14531
- Can Canada harness the wind 13 p0053 A77-15047
- New England wind power...coastal or mountain 13 p0058 A77-16250
- Windmills change direction --- British system utilizing offshore windmills and depleted North Sea fields 13 p0060 A77-16620
- Potentialities and limitations of the utilization of wind machines 13 p0061 A77-16787
- Wind power --- wind-powered plant design 14 p0136 A77-20042
- A power plant of the Aerosolec type 14 p0153 A77-21839
- The application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine 14 p0156 A77-22142
- Materials and processing approaches to cost competitive wind turbine rotor blades 14 p0157 A77-22144
- Simulation of wind turbine generator system power flow dynamics 14 p0158 A77-22650
- Aspects of surface wind behaviour 14 p0165 A77-23357
- Engineering development status of the Darrieus wind turbine 14 p0166 A77-24365
- Rotor/generator isolation for wind turbines [AIAA 77-372] 14 p0180 A77-25782
- The high potential of wind as an energy source 14 p0183 A77-26084
- Flap-augmented shrouds for aerogenerators 14 p0183 A77-26085
- A method for increasing the efficiency of the electric generating process 14 p0183 A77-26087
- Analysis of the wind-driven reciprocator 14 p0183 A77-26088
- An economic evaluation of small-scale wind powered electric generation systems [ASME PAPER 76-WA/ENER-1] 14 p0185 A77-26430
- Tornado-type wind energy system - Basic consideration [ASME PAPER 76-WA/ENER-2] 14 p0185 A77-26431
- Potential application of radial splitter diffuser to shrouded wind turbines 14 p0199 A77-29071
- Composition method for constructing guaranteed-output curves of solar- and wind-power plants utilized jointly 14 p0201 A77-29534
- Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks 15 p0267 A77-32243
- Wind energy in practical use: Wheels, rotors, mills, wind power plants --- German book 15 p0271 A77-33114
- A wind energy system utilizing high pressure electrolysis as a storage mechanism 15 p0279 A77-33376
- Evaluating a combined wind power/energy storage system 15 p0287 A77-33596

- Tests of a combined wind and solar power plant under natural conditions 15 p0294 A77-35415
- Utilizing alternative energy sources in France 15 p0296 A77-35923
- Implementation issues of wind energy --- cost analysis [AIAA 77-1025] 16 p0404 A77-41565
- A theory and experimental investigation of ducted wind turbines 16 p0410 A77-42072
- Effects of wind fluctuations on windmill behaviour 16 p0410 A77-42073
- Variable speed wind turbines for high wind energy conversions 16 p0410 A77-42074
- Compact shrouds for wind turbines 16 p0416 A77-42891
- The spacing of wind turbines in large arrays 16 p0416 A77-42893
- Economic competitiveness of windmills 16 p0417 A77-42898
- Utilization of wind energy for electrical power supplies to ESSOR stationary platforms --- tropospheric tethered balloon experiment 16 p0427 A77-45610
- Wind power - Pipe dream or reality 16 p0442 A77-48503
- Some contributions to aerodynamic theory for vertical axis wind turbines 16 p0467 A77-48897
- Experimental data and theoretical analysis of an operating 100 kW wind turbine 16 p0467 A77-48898
- Fluid dynamics of diffuser augmented wind turbines 16 p0467 A77-48899
- An assessment of wind-powered generators for navigational aids 16 p0468 A77-48900
- Design and operational evaluation of a 25 kW wind turbine generator for residential heating applications 16 p0468 A77-48901
- Segmented and self-adjusting wind turbine rotors 16 p0468 A77-48902
- Recent Canadian activities in wind power 16 p0470 A77-48916
- Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario 16 p0489 A77-49085
- Some legal-institutional implications of offshore wind energy conversion systems 16 p0489 A77-49086
- Wind-electric conversion utilizing field modulated generator systems 16 p0489 A77-49087
- Energy content of winds in the high plains region of southwestern U.S. 16 p0490 A77-49089
- Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions 16 p0490 A77-49091
- Diffuser augmentation of wind turbines 16 p0490 A77-49093
- Large windpower systems integrated with existing electric utilities 16 p0490 A77-49094
- Self-regulating composite bearingless wind turbine 16 p0491 A77-49095
- The Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories 16 p0491 A77-49096
- Early operation experience on the ERDA/NASA 100 kW wind turbine --- rotor blade loads [NASA-TM-X-71601] 13 p0086 A77-10640
- Costs of alternative sources of electricity [PB-255765/0] 13 p0107 A77-12528
- An estimate of the interaction of a limited array of windmills --- feasibility of windpower group station for proposed site [DM-16] 13 p0114 A77-13539
- Wind tunnel performance data for the Darrieus wind turbine with NACA 0012 blades [SAND-76-0130] 14 p0214 A77-18057
- Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks [NASA-TM-X-73613] 14 p0220 A77-19580
- Experimental and analytical research on the aerodynamics of wind turbines [COO-2615-76-T-1] 14 p0223 A77-19613
- Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories [SAND-76-5712] 14 p0223 A77-19616
- Optimization and characteristics of a sailing windmill rotor [PB-259898/5] 14 p0234 A77-20622
- A 100-kW metal wind turbine blade basic data, loads and stress analysis [NASA-CR-134956] 14 p0236 A77-21467
- A 100-kW wind turbine blade dynamics analysis, weight-balance, and structural test results [NASA-CR-134957] 14 p0236 A77-21468
- Sandia vertical-axis wind turbine program [SAND-76-0338] 14 p0250 A77-21686
- Geothermal Energy and Wind Power: Alternate energy sources for Alaska [PB-261521/9] 15 p0349 A77-22678
- Development and adaptation of field modulated generator systems for wind energy applications [PB-263604/1] 15 p0357 A77-23625
- Barriers to the use of wind energy machines: The present legal/regulatory regime and a preliminary assessment of some legal/political/societal problems [PB-263576/1] 15 p0366 A77-24620
- An analysis of the feasibility of windmills for power generation in New York State [RPI-TA-17] 15 p0380 A77-26638
- Wind energy: A renewable energy option 16 p0525 A77-30276
- Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator [NASA-TM-73718] 16 p0529 A77-30611
- Wind machines [NSF/RA/W-75-051] 16 p0529 A77-30620
- WINDPOWERED PUMPS**
- Potentialities and Limitations of the utilization of wind machines 13 p0061 A77-16787
- An investigation of peristaltic pumping phenomena with wind energy applications 16 p0545 A77-32586
- WING LOADING**
- Design of a large span-distributed load flying-wing cargo airplane [NASA-TM-X-74031] 15 p0353 A77-23089
- WING SPAN**
- Design of a large span-distributed load flying-wing cargo airplane [NASA-TM-X-74031] 15 p0353 A77-23089
- WING TIPS**
- Vortex kinetic energy concentrator 13 p0044 A77-12870
- WING-FUSELAGE STORES**
- The technical concept of the IL-62M. II - Fuel system 14 p0156 A77-22120
- WINTER**
- Insolation and temperature statistics and their influence on the design of solar heating systems and the electric utility interface 16 p0479 A77-49000
- WIRE WINDING**
- Armature of the MIT-EPRI superconducting generator 14 p0157 A77-22575
- WISCONSIN**
- The Wisconsin Regional Energy project - An applied systems analysis approach to regional energy/environment modeling 15 p0309 A77-36825
- WOOD**
- Energy from wood wastes 15 p0273 A77-33301
- Production of a hydrocarbon-type synthetic fuel from wood [NRC-15638] 13 p0127 A77-15210
- WOODEN STRUCTURES**
- The application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine 14 p0156 A77-22142
- WORK FUNCTIONS**
- Thermonic converter performance with oxide collectors 16 p0466 A77-48888

## WORKING FLUIDS

- Economic optimization of binary fluid cycle power plants for geothermal systems 13 p0029 A77-12744
- Geothermal powered heat pumps to produce process heat 13 p0030 A77-12754
- Liquid-metal magnetohydrodynamic system evaluation --- coal-fired designs 13 p0034 A77-12784
- Organic Rankine Cycle Engine development and solar energy utilization 13 p0077 A77-19096
- Tradeoff between selectivity and concentration in the collection of solar energy 14 p0150 A77-21810
- Continuous solar air conditioning with ammonia/water absorption cycle 14 p0182 A77-26057
- Performance gravity-assisted heat pipes operated at small tilt angles [AIAA PAPER 77-750] 15 p0311 A77-37263
- Two-phase working fluids for the temperature range 100-350 C --- in heat pipes for solar applications [AIAA PAPER 77-753] 15 p0312 A77-37266
- Results of closed cycle MHD power generation tests with a helium-caesium working fluid 15 p0326 A77-39533
- The design of a sodium sulfate decahydrate heat exchanger for coolness storage --- in solar-powered air conditioning system 16 p0450 A77-48760
- A comparison of three working fluids for the design of geothermal power plants 16 p0455 A77-48800
- The use of mixture working fluids in geothermal binary power cycles 16 p0455 A77-48802
- 600 kW Organic Rankine Cycle Waste Heat Power Conversion System 16 p0459 A77-48829
- High temperature solar collector with an Archimedes concentrator 16 p0460 A77-48833
- Sensitivity analysis for OTEC propane and mixture cycles --- Ocean Thermal Energy Conversion 16 p0485 A77-49047
- An immiscible fluid - Heat of fusion energy storage system 16 p0493 A77-49113
- Closed Brayton cycle using hydrogen as a work fluid [BNL-20899] 13 p0085 A77-10542
- Heat pipes for the temperature range from 200 to 600 C --- noting sulfur with iodine additive as working fluid 13 p0119 A77-14381
- Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant [PB-261564/9] 15 p0349 A77-22684

## WYOMING

- Assessing low sulfur coal resources in Montana and Wyoming 13 p0058 A77-16374
- Draft environmental assessment of application by ERDA for a special land use permit for use of public lands in Wyoming for in situ coal gasification experiments [UCID-17011] 13 p0100 A77-11572
- The spatial characteristics of three Wyoming fuels [AD-A030873] 14 p0233 A77-20612

## X

## X RAY ANALYSIS

- XRF analysis of some regenerated catalysts [NRL-TN-388] 15 p0376 A77-26247

## X RAY DIFFRACTION

- Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier [PB-266854/9] 16 p0525 A77-30255

## X RAY FLUORESCENCE

- XRF analysis of some regenerated catalysts [NRL-TN-388] 15 p0376 A77-26247

## X RAY LASERS

- Soft X-ray lasers [SAND-76-5542] 14 p0219 A77-19425

## X-15 AIRCRAFT

- Hypersonic technology-approach to an expanded program 13 p0051 A77-14597

## XENON LAMPS

- Silicon solar cell testing in concentrated sunlight and simulated sunlight 16 p0527 A77-30540

## Y

## YAG LASERS

- Analysis of the sun pumped laser cone optics [AD-A034284] 15 p0361 A77-24483

## YELLOWSTONE NATIONAL PARK (ID-MT-WY)

- Thermographic mosaic of Yellowstone National Park p0001 A77-10121
- Geothermal significance of magnetotelluric sounding in the eastern Snake River Plain-Yellowstone region 15 p0310 A77-36999

## YTTRIUM COMPOUNDS

- Photoelectrolysis with YFeO<sub>3</sub> electrodes --- water splitting using solar energy 16 p0399 A77-40553

## Z

## Z-37 AIRCRAFT

- The propulsion system of the aircraft Z-37. I 14 p0156 A77-22121

## ZINC COMPOUNDS

- Evaluation of a 1 kWh zinc chloride battery system [PB-260683/8] 14 p0236 A77-21356
- Engineering design and cost analysis of chlorine storage concepts for a zinc-chlorine load-leveling battery [PB-262016/9] 14 p0252 A77-21727

## ZINC SELENIDES

- Reactions in the ZnSe thermochemical cycle for hydrogen production 14 p0178 A77-24854
- Recent developments in the engineering and chemistry of the ZnSe thermochemical hydrogen cycle 16 p0457 A77-48815

- Preliminary assessment of economics of hydrogen production from Lawrence Livermore Laboratory ZnSe thermochemical cycle [UCRL-13711] 16 p0536 A77-31626

## ZINC TELLURIDES

- Cathodes for photodriven hydrogen generators - ZnTe and CdTe 15 p0296 A77-35921

## ZIRCONIUM ALLOYS

- Thermal barrier coating on high temperature industrial gas turbine engines [NASA-CR-135147] 15 p0390 A77-27496

## ZIRCONIUM HYDRIDES

- Uranium zirconium hydride reactor space power systems [IAF PAPER 76-256] 13 p0004 A77-10953

## ZIRCONIUM NITRIDES

- Spectral reflectance of TiN/x/ and ZrN/x/ films as selective solar absorbers 16 p0423 A77-44492

## ZONE MELTING

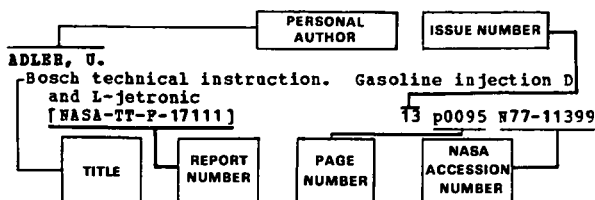
- Silicon solar cells on zone-melted silicon/graphite substrates 16 p0426 A77-45303

# PERSONAL AUTHOR INDEX

ENERGY / A Continuing Bibliography (Issue 16)

JANUARY 1978

## Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g. NASA report, translation, NASA contractor report). The issue, page and accession numbers are located beneath and to the right of the title, e.g. 13 p0095 N77-11399. Under any one author's name the accession numbers are arranged in sequence with the IAA accession numbers appearing first.

## A

- AAHODT, E. L.**  
Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- AAHOT, H. W. C.**  
Utility distribution systems in Iceland  
[AD-A026556] 13 p0126 N77-14957
- ABATUT, J. L.**  
Interaction between the solar mirror field and the thermodynamic system of a turning solar power plant  
14 p0151 A77-21824
- ABATUT, J.-L.**  
Production of electricity through thermodynamic conversion of solar energy - 10 MWe project  
15 p0270 A77-32591
- ABBASPOUR, H.**  
The proper use of thermal storages for a solar assisted heat pump heating system  
[ASME PAPER 76-WA/HT-76] 14 p0187 A77-26492
- ABBAY, A. B.**  
Measurement of dry deposition of fossil fuel plant pollutants  
[PB-264495/3] 15 p0376 N77-25685
- ABBIN, J. P., JR.**  
Rankine cycle energy conversion system design considerations for low and intermediate temperature sensible heat sources  
[SAND-76-0363] 14 p0251 N77-21699
- ABDALLAH, Y.**  
Selection of optimal pan color for solar water heater  
13 p0078 A77-19104
- ABDEL-AAL, H. K.**  
On the storage of solhydrogen  
13 p0075 A77-19073
- ABDEL-HANNEED, H. P.**  
New frontiers in solar and other energy options  
13 p0079 A77-19118
- ABDEL-KHALIK, S. I.**  
Performance of a solar heating system utilizing phase-change energy storage  
16 p0480 A77-49004
- ABDEL-KHALIK, S. I.**  
Performance of a solar heating system utilizing phase-change energy storage  
[CONF-760842-11] 15 p0393 N77-27540
- ABDEL-MONEEM, M. S.**  
A new method for collector field optimization  
13 p0074 A77-19070

- ABDELGHAFAR, H. A.**  
A theory and experimental investigation of ducted wind turbines  
16 p0410 A77-42072
- ABDOU, M. A.**  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NS-11] 14 p0188 A77-26496
- ABDOU, M. A.**  
Tokamak experimental power reactor  
[CONF-761107-23] 15 p0397 N77-27946
- ABDUL-AZEEM, E. M.**  
Thermo-chemical production of hydrogen  
13 p0075 A77-19074
- ABDUL-SALAM, E.**  
Thermo-chemical production of hydrogen  
13 p0075 A77-19074
- ABDUL-SALAM, E. M.**  
Preliminary design data for a solar house in Riyadh, Saudi Arabia  
13 p0078 A77-19112
- ABE, H.**  
A study of the effects of new transportation systems on urban transportation and environment by computer simulation  
16 p0430 A77-46652
- ABE, T.**  
Dynamic characteristics of the desulfurization plant boiler draft system for power stations  
15 p0338 A77-40201
- ABELSON, H.**  
Environmental assessment sampling and analytical strategy program  
[PB-261259/6] 15 p0352 N77-23021
- ABENS, S. G.**  
Fuel cell stacks  
[AD-A024216] 13 p0090 N77-10684
- ABENS, S. G.**  
Fuel cell stacks  
[AD-A030375] 14 p0213 N77-17603
- ABENS, S. G.**  
New materials for fluorosulfonic acid electrolyte fuel cells  
[AD-A036988] 15 p0380 N77-26640
- ABENS, S. G.**  
Fuel cell stacks  
[AD-A037586] 15 p0380 N77-26641
- ABERT, J. G.**  
Municipal solid waste recovery - A public or private risk  
15 p0273 A77-33299
- ABU-KHATER, B.**  
Hydrogen sulfide stress corrosion cracking in materials for geothermal power  
[COO-2576-3] 16 p0519 N77-29269
- ACHARD, J. C.**  
A new hydrogen storage electrode  
13 p0047 A77-13539
- ACHENBACH, J. D.**  
Heat extraction from hot dry rock masses  
[PB-256775/8] 13 p0116 N77-13556
- ACHENBACH, J. D.**  
Heat extraction from hot, dry rock masses  
[PB-265116/4] 16 p0516 N77-28609
- ACKERMAN, J. E.**  
Fuel cell benefit analysis  
[AEL-ES-51] 14 p0232 N77-20593
- ACKERMAN, E.**  
Advanced engine design concepts and their influence on the performance of multi-role combat aircraft  
15 p0339 N77-22116
- ACKERMAN, H.**  
Emissions from compressor stations  
15 p0287 A77-33545
- ACKERMAN, J.**  
A small but important contribution to the German-American solar research programme 'Helios'  
15 p0323 A77-39125



- ADAMS, A. A.  
Improved acid electrolytes for the hydrocarbon-air fuel cell 14 p0195 A77-28166  
Research on electrochemical energy conversion systems [AD-A023689] 13 p0090 N77-10681  
An improved electrolyte for direct oxidation fuel cells [AD-A026164] 13 p0131 N77-15518  
Research on electrochemical energy conversion systems [AD-A034454] 15 p0367 N77-24632
- ADAMS, J. A., JR.  
Atmospheric carbon dioxide variations at the South Pole 13 p0067 A77-18439
- ADAMS, J. W.  
Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation [PB-268232/6] 16 p0542 N77-32051
- ADAMS, M. E.  
Economic evaluation by ERDA of alternative fossil energy technologies 15 p0300 A77-36328
- ADLER, D.  
Operation of ITO/Si heterojunction solar cells 13 p0014 A77-11762  
Indium-tin-oxide-silicon heterojunction photovoltaic devices 15 p0259 A77-30735
- ADLER, U.  
Bosch technical instruction. Gasoline injection D and L-jetronic [NASA-TT-F-17111] 13 p0C95 N77-11399
- ADSETT, E. E.  
Solar heating and cooling in a commercial building 16 p0477 A77-48983
- APFENS, W. A.  
Ignition of flammable gases in crude-oil tankers as a result of metal fracture [AD-A027411] 13 p0127 N77-15121
- AFGAN, M. E.  
Future energy production systems: Heat and mass transfer processes. Volume 1 13 p0056 A77-16201  
Future energy production systems: Heat and mass transfer processes. Volume 2 14 p0174 A77-24201
- AGAGU, O. K.  
Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 N77-18562
- AGRAWAL, R. C.  
Flat petrol engine performance with a mixture of basil extract with petrol 14 p0179 A77-25196
- AHLGREN, W. L.  
LLL-Sohio solar process heat project. Report no. 3: LLL solar energy group [UCID-16630-3] 13 p0123 N77-14604
- AHLUWALIA, B. K.  
Regenerative vapor cycle with isobutane as working fluid [PB-262704/0] 15 p0356 N77-23622
- AHMED, S.  
Thermal energy management techniques in spacecraft design and their potential for terrestrial applications 16 p0439 A77-47969
- AHMED, S. B.  
IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125] 13 p0122 N77-14594
- AHNBER, D. J.  
Implications of utilizing synthetic fuels in combined cycles 14 p0193 A77-27301
- AIACHE, L.  
Alternating photoelectrochemical converters 13 p0077 A77-19093  
Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814  
Geometric catoptrics - Applications to solar energy 14 p0166 A77-23383
- The geometry of catoptric light. II - An application to solar energy 16 p0417 A77-42959
- AITKEN, D. W.  
Project Sunshower - San Jose State University dormitory retrofit to solar-assisted water heating 16 p0479 A77-48996  
Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131
- AIYANA, Y.  
Experiment on MHD generator with a large-scale superconducting magnet /ETL Mark V/ 13 p0049 A77-13728
- AKHMEZIANOV, A. M.  
Equation solution accuracy in calculating jet engine characteristics 13 p0020 A77-12502
- AKHMEN, Y. V.  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method [BLL-M-25448-(5828.4F)] 13 p0114 N77-13235
- AKRIDGE, L.  
Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters [ANL-ES-54] 15 p0394 N77-27547
- AKSELROD, S. K.  
Equation solution accuracy in calculating jet engine characteristics 13 p0020 A77-12502
- AKSENOV, L. P.  
Solar heating in residential houses in Uzbekistan 15 p0316 A77-37774  
Residential solar heating in Uzbekistan 16 p0437 A77-47430
- AKUTA, T.  
Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831
- AKYLHAZ, B. O.  
Trade-off analyses for multi-objective transportation plans 13 p0102 N77-11911
- ALADIEV, I.  
Use of solar water-heating installations in the combined cycle of a thermal electric power plant 14 p0152 A77-21825
- ALAVIDEE, G. R.  
Calculation of turbulent magnetohydrodynamic boundary layers in MHD generator channels 13 p0046 A77-13242
- ALAVUTDINOV, D. B.  
A Cassegrain system for solar radiation 13 p0063 A77-17561
- ALBERTSON, V. D.  
Large-scale thermal storage in rock - Construction, utilization, and economics 16 p0451 A77-48769  
Solar power arrays for the concentration of energy [COO-2699-2] 13 p0087 N77-10651
- ALBRECHT, L.  
Economics of solar heating with homeowner-type financing 16 p0501 A77-50210
- ALBRECHT, W.  
On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells 16 p0425 A77-45151  
Investigation of acid-resistant electrocatalysts for fuel cells [NASA-TT-F-17367] 14 p0207 N77-16444
- ALDERMAN, J. K.  
Acid mine drainage - The problem and the solution 16 p0425 A77-45125
- ALEKSEENKO, D. V.  
Investigation of the 'crisis' of heat and mass transfer in low-temperature wickless heat pipes 15 p0316 A77-37927
- ALEKSEYEV, M. P.  
Effect of nitrogenous bases on the thermal stability of jet fuels [NASA-TN-75131] 15 p0388 N77-27243

- ALMEIDA, T.**  
Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864
- ALEXANDER, J. P., JR.**  
A United States energy model economically driven by a global growth simulation  
15 p0319 A77-38220
- ALEXANDER, L. A.**  
Stimulation of the solar industry by way of the Federal Buildings Program  
16 p0462 A77-48850
- ALEXANDER, T.**  
Industry can save energy without stunting its growth  
15 p0267 A77-32209
- ALEXANDROFF, G.**  
Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern France  
16 p0417 A77-42963
- ALFF, R. K.**  
The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification  
[ASME PAPER 77-JPGC-GT-7]  
16 p0509 A77-51624
- ALICH, J. A., JR.**  
Energy from agriculture  
15 p0314 A77-37664  
Agricultural and forestry wastes as an energy resource  
16 p0489 A77-49083
- ALIMOV, A. K.**  
A Cassegrain system for solar radiation  
13 p0063 A77-17561
- ALKIDAS, A. C.**  
Coal particle integrity in high-temperature solvents, with and without agitation  
16 p0401 A77-41317
- ALLARD, MR.**  
Problems relating to heat storage  
14 p0152 A77-21826
- ALLREDGE, J. R.**  
GDIST: A computer code for analysis of statistical distributions of physical data  
[PB-266762/4]  
16 p0533 N77-31589
- ALLEN, C. A.**  
Fluidized bed heat exchangers for geothermal applications  
13 p0029 A77-12748  
Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations  
16 p0455 A77-48799
- ALLEN, J.**  
Development of compound parabolic concentrators for solar-thermal electric and process heat applications  
13 p0038 A77-12812  
Development of compound parabolic concentrators for solar thermal applications  
[ASME PAPER 76-WA/SOL-11]  
14 p0189 A77-26516  
Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications  
16 p0483 A77-49031
- ALLEN, J. E.**  
Have energy, will travel  
16 p0409 A77-41933
- ALLEN, J. W.**  
Design problems associated with the use of evacuated glass receivers for solar collectors  
[CONF-7606128-1]  
15 p0393 N77-27536
- ALLEN, R. W.**  
Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data  
13 p0039 A77-12824  
Solar powered absorption cycle simulation using real and stochastic weather data  
[ASME PAPER 76-WA/SOL-6]  
14 p0188 A77-26511  
Parametric study of a dynamic solar powered absorption cycle  
16 p0475 A77-48961  
Solar powered absorption air-conditioning system performance using real and synthetic weather data  
16 p0479 A77-49002  
Optimization studies of solar absorption air conditioning systems  
[NSF/RAWH/SE/GI-39117/PB-76/2]  
14 p0250 N77-21690
- Proceedings of the Solar Industrial Process Heat Workshop  
[CONF-760655]  
15 p0373 N77-25643
- ALLER, P.**  
Multipurpose insulation system for a radioisotope fueled Mini-Brayton Heat Source Assembly  
13 p0022 A77-12678
- ALLISON, H. J.**  
An energy center in Sri Lanka  
13 p0021 A77-12669  
Performance characteristics of a high-pressure, moderate temperature, electrolysis system  
15 p0277 A77-33361  
A wind energy system utilizing high pressure electrolysis as a storage mechanism  
15 p0279 A77-33376  
Performance characteristics of a high-pressure, moderate temperature, electrolysis system  
14 p0238 N77-21595  
A wind energy system utilizing high pressure electrolysis as a storage mechanism  
14 p0240 N77-21610  
Development and adaptation of field modulated generator systems for wind energy applications  
[PB-263604/1]  
15 p0357 N77-23625
- ALLSUP, J. R.**  
Experimental results using methanol and methanol/gasoline blends as automotive engine fuel  
[BERC/RI-76/15]  
15 p0389 N77-27245
- ALLUMS, S. L.**  
An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator  
16 p0473 A77-48952  
An analytical and experimental investigation of a 1.8 by 3.7 meter Fresnel lens solar concentrator  
[NASA-TP-1005]  
16 p0529 N77-30617
- ALMS, F. U.**  
Controlled tipping of combustion residues  
13 p0008 A77-11175
- ALT, C. B.**  
National petroleum product supply and demand, 1976 - 1978  
[PB-254969/9]  
13 p0084 N77-10224
- ALTENDORF, J. P.**  
A comparison between the primary energy consumption of electric and gasoline powered vehicles  
14 p0159 A77-22885
- ALTER, H.**  
Municipal solid waste as a resource for energy recovery and conservation  
15 p0313 A77-37655
- ALTSHULER, A.**  
The politics of urban transportation innovation  
15 p0287 A77-33600
- ALUMBAUGH, E. L.**  
Experimental polyurethane foam roofing systems  
[AD-A031046]  
14 p0210 N77-17255
- ALVIS, R. L.**  
Total energy systems: Solar energy program  
[SAND-76-5758]  
16 p0514 N77-28591
- ALWARD, R.**  
Rural energy centre for Africa using solar, wind and biogas energies  
16 p0496 A77-49139
- ANAND, T.**  
Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions  
14 p0149 A77-21801
- ANAR, R. C.**  
Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids  
16 p0411 A77-42160
- ANATO, I.**  
Porous electrodes for Zn/air alkaline battery  
16 p0431 A77-46722
- ANEND, W. E.**  
Investigation of two-phase liquid-metal magnetohydrodynamic power systems  
13 p0057 A77-16212
- AMES, J.**  
The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model  
[PB-264822/8]  
16 p0517 N77-28628

- ANINOV, A.  
Quasi-analog models of large systems of algebraic equations  
16 p0433 A77-46959
- ANNON, R. L.  
Development progress on the Sulfur Cycle Water Decomposition System  
16 p0457 A77-48813
- ANODE, J. O.  
Analysis of a heat pipe exchanger  
13 p0112 N77-13355
- ANODIO, U.  
Evolution of thermal traction - From the diesel engine to the gas turbine  
13 p0004 A77-10976
- ANAND, D. K.  
Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data  
13 p0039 A77-12824  
Solar powered absorption cycle simulation using real and stochastic weather data [ASME PAPER 76-WA/SOL-6]  
14 p0188 A77-26511  
Parametric study of a dynamic solar powered absorption cycle  
16 p0475 A77-48961  
Solar powered absorption air-conditioning system performance using real and synthetic weather data  
16 p0479 A77-49002  
Proceedings of the Solar Industrial Process Heat Workshop [CONF-760655]  
15 p0373 N77-25643
- ANANTH, K. P.  
Fine shredding of municipal solid waste [PB-257105/7]  
13 p0133 N77-15919
- ANDERSON, B.  
A non-technical evaluation of four different concrete wall solar collector configurations  
16 p0478 A77-48990
- ANDERSON, C. J.  
Supply and demand of fuel sources for automobiles [JCL-78066]  
14 p0219 N77-19275  
Biosolar syntels for transportation [JCL-52208]  
16 p0514 N77-28593
- ANDERSON, D. E.  
Solar thermal system requirements  
16 p0481 A77-49017
- ANDERSON, D. E.  
Infrared extinction spectra of some common liquid aerosols  
15 p0290 A77-34561
- ANDERSON, D. E.  
Emissions and performance of catalysts for gas turbine catalytic combustors [NASA-TN-X-73543]  
13 p0104 N77-12406
- ANDERSON, E. E.  
Distribution of direct and total solar radiation availabilities for the USA  
16 p0471 A77-48926
- ANDERSON, J. A.  
The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California [PB-254449/2]  
13 p0092 N77-10720
- ANDERSON, K. E.  
Performance characteristics of solid lithium-aluminum alloy electrodes  
13 p0007 A77-11107
- ANDERSON, K. P.  
The long-run marginal costs of energy [PB-252504/6]  
13 p0065 N77-10625  
A simulation analysis of US energy demand, supply, and prices [PB-254314/8]  
13 p0090 N77-10680
- ANDERSON, L. E.  
Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe  
15 p0259 A77-30742  
Semiconductor-electrolyte photovoltaic energy converter [PB-252837/0]  
13 p0099 N77-11548
- ANDERSON, P. E.  
Double-exposure collectors with mirrors for solar-heating systems [ASME PAPER 76-WA/HT-16]  
14 p0186 A77-26476  
Energy and the future  
14 p0246 N77-21657
- ANDERSON, R. L.  
Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells  
15 p0259 A77-30736
- ANDERSON, T. D.  
Summary report: An exploratory study of cost targets for solar electric power plants [ORNL-TN-5787]  
16 p0538 N77-31654
- ANDERSON, V. E.  
Prototype hydrogen automobile using a metal hydride  
15 p0282 A77-33398  
Prototype hydrogen automobile using a metal hydride  
14 p0244 N77-21636
- ANDERSON, W. A.  
Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509  
Factors which maximize the efficiency of Cr-p-Si Schottky /HIS/ solar cells  
15 p0288 A77-34103  
Silicon Schottky photovoltaic diodes for solar energy conversion [PB-263172/9]  
15 p0357 N77-23624  
Silicon Schottky photovoltaic diodes for solar energy conversion [PB-268457/9]  
16 p0547 N77-32604
- ANDERSON, W. D.  
Experimental data and theoretical analysis of an operating 100 kW wind turbine  
16 p0467 A77-48898  
A 100-kW wind turbine blade dynamics analysis, weight-balance, and structural test results [NASA-CR-134957]  
14 p0236 N77-21468
- ANDERSON, W. W.  
Semiconductor-electrolyte photovoltaic cells employing CdSe and CdTe  
15 p0259 A77-30742  
Semiconductor-electrolyte photovoltaic energy converter [PB-252837/0]  
13 p0099 N77-11548
- ANBARAZAROV, M.  
Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions  
15 p0286 A77-33435  
Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia  
16 p0427 A77-45548
- ANNEN, K. D.  
MHD systems with low cooling requirements  
15 p0332 A77-39575
- ANOKHIN, P. I.  
The M-14P aircraft engine  
15 p0320 A77-38300
- ANSPAUGH, L. E.  
Overview of the Imperial Valley environmental project [UCID-17067]  
13 p0132 N77-15533
- ANSTAUUGH, B. E.  
Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature [NASA-CR-155166]  
16 p0553 N77-33604
- ANTAL, M. J., JR.  
Synthetic fuels from solid wastes and solar energy  
15 p0275 A77-33336  
Synthetic fuels from solid wastes and solar energy  
14 p0237 N77-21565
- ANTHONY, D. B.  
Coal devolatilization and hydrogasification  
14 p0200 A77-29450
- ANTONIUK, E. I.  
High temperature solar collector with an Archimedes concentrator  
16 p0460 A77-48833
- ANTONIUK, D.  
Analysis of coal particles undergoing rapid pyrolysis  
14 p0175 A77-24212
- ANTONOPoulos, P. T.  
Management analysis of nuclear allocation for the generation of electricity  
16 p0413 A77-42590
- ANWAR, M. M.  
Double-faced silicon solar cell system  
13 p0076 A77-19090

- AOKI, Y.**  
Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel  
15 p0328 A77-39550
- APARISI, R. E.**  
Problems of energy storage in solar power stations  
13 p0063 A77-17555  
Tower-type solar energy plant - Configuration and energy efficiency of concentrator  
14 p0143 A77-21314  
Utilization of solar radiation in large solar power plants with hydraulic storage  
14 p0152 A77-21827  
Thermal optimization of steam generating systems for tower type solar steam power plants - Tasks and methods  
14 p0152 A77-21830  
Solar energy systems of the tower type - Arrangement and heat-stability of the receivers and steam generators  
15 p0316 A77-37770  
A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators  
16 p0437 A77-47426
- APGAR, B. A.**  
Superconducting magnet development for the MHD program  
15 p0331 A77-39569
- APPARAO, T. A. P. S.**  
Application of gravitational energy exchange to tracked urban transit systems  
14 p0200 A77-29468
- APPELBAUM, J.**  
Performance analysis of a solar-electrical system with a load and storage batteries  
14 p0177 A77-24570  
The influence of parameter dispersion of electrical cells on the array power output  
16 p0420 A77-44264  
Array power output of non-identical electrical cells  
16 p0468 A77-48903
- APPELL, H. R.**  
COSTEAM: Low-rank coal liquefaction - An updated analysis  
13 p0045 A77-12934  
Hydrogenation of lignite with synthesis gas  
14 p0201 A77-29525
- APPLEBY, A. J.**  
A parametric analysis of the structure of international energy consumption  
15 p0298 A77-36242  
Accounting methods for new-technology non-utility energy installations  
15 p0322 A77-38675
- APPLETON, A. D.**  
Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator  
14 p0144 A77-21386
- APSIMON, H. E.**  
Modelling the atmospheric dispersal of radioactive pollutants beyond the first few hours of travel  
15 p0395 N77-27603
- ARANA, V.**  
Isotopic composition of steam samples from Lanzarote, Canary Islands  
13 p0013 A77-11497
- ARANOVICH, J.**  
Applied research on II-VI compound [PB-254637/2]  
13 p0098 N77-11547
- ARBO, P. E.**  
Analysis of the technical and cost feasibility of solar and/or wind energy systems for Coast Guard public quarters [AD-A026332]  
14 p0209 N77-16460
- ARCELLA, F. G.**  
The heat pipe heat bridge and thermal controller [AIAA PAPER 77-751]  
15 p0311 A77-37264
- ARCHER, D. E.**  
Fluidized bed adiabatic combustor power plants - Concepts and comparisons  
16 p0453 A77-48784
- ARCHIBALD, R. E.**  
The impact of the energy crisis on the demand for fuel efficiency - The case of general aviation  
16 p0410 A77-42038
- ARGOOD, H. J.**  
Lightweight reflector assembly [NASA-CASE-NPO-13707-1]  
16 p0518 N77-28933
- ARISSESON, P. C.**  
Comparison of measurements and predictions of the fluid mechanics and thermal behavior of MHD channel slag layers  
15 p0330 A77-39564
- ARKANIAN, Z. V.**  
The analysis of the temperature regimes of the operation of a gas-regulated heat pipe  
13 p0064 A77-17924
- ARNAS, B.**  
Thermoelectric conversion of solar energy by means of refractory B4Si compounds  
14 p0154 A77-21848
- ARNBRUST, S.**  
Possibilities for utilizing wind energy  
13 p0056 A77-15053
- ARNSTEAD, H. C. H.**  
Geothermal energy development  
14 p0194 A77-27881
- ARNSTRONG, P. W.**  
Gas turbine evolution  
16 p0429 A77-46402
- ARNSTRONG, G. T.**  
Estimation of net enthalpies of combustion of some aviation fuels expressed in the international system of units (SI) [NBS-TN-937]  
16 p0550 N77-33370
- ARNSTRONG, J. E.**  
Future energy options, ethics and a case for conservation  
16 p0415 A77-42860
- ARNORSSON, S.**  
The utility of waters from the high-temperature areas in Iceland for space heating as determined by their chemical composition  
13 p0012 A77-11496
- ARONSON, E. A.**  
An assessment of mechanical energy storage for solar systems  
16 p0460 A77-48839
- ARONSON, E. B.**  
Fuel cells - A sleeper in the energy race  
14 p0170 A77-23647  
Will electricity power tomorrow's trains  
14 p0199 A77-29088  
Geothermal energy - Tapping nature's boiler room  
16 p0437 A77-47600
- ARORA, J. L.**  
The manufacture of hydrogen from coal  
15 p0275 A77-33337  
The manufacture of hydrogen from coal  
14 p0237 N77-21566
- ARP, V. D.**  
Helium research in support of superconducting power transmission [PB-265076/0]  
15 p0390 N77-27326
- ARROYO, J. L.**  
Increase of diffusion lengths of minority carriers under the effect of a width gradient of the forbidden band  
14 p0151 A77-21823
- ARTENOV, V. I.**  
Construction of two-dimensional steady-state solution of equations of a nonequilibrium magnetized plasma  
13 p0065 A77-18130  
On the construction of plane stationary solutions of equations for nonequilibrium magnetized plasma  
16 p0420 A77-43705
- ASAI, S.**  
Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions  
16 p0412 A77-42407
- ASAKURA, S.**  
Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy  
15 p0274 A77-33334
- ASARE, B.**  
Domestic hot water and solar energy in Ireland  
16 p0430 A77-46608
- ASBURY, J. G.**  
Solar energy and electric utilities - Should they be interfaced  
14 p0143 A77-21281

- Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany  
[ANL-ES-50] 15 p0365 N77-24612
- Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters  
[ANL-ES-54] 15 p0394 N77-27547
- Solar energy and electric utilities: Can they be interfaced?  
[ANL-ES-52] 16 p0515 N77-28601
- ASHCROFT, H.  
A solar home for low income families  
16 p0476 A77-48970
- ASHEE, W. J.  
Evaluation of rail rapid transit and express bus service in the urban commuter market  
[PB-265236/0] 15 p0398 N77-28046
- ASHLEY, H.  
Some contributions to aerodynamic theory for vertical axis wind turbines  
16 p0467 A77-48897
- ASHLEY, T. S., III  
Analytical and experimental treatment of a spray-on selective coating - Application to collector design  
16 p0487 A77-49064
- ASHWORTH, R. A.  
Utilization of low and intermediate BTU gas from coal for iron ore pelletizing  
[PB-264702/2] 15 p0389 N77-27247
- ASINOVSKII, B. I.  
Limiting capabilities with respect to electric power generation of a pulsed MHD generator operating at a resistive load  
13 p0064 A77-17917
- Threshold capabilities of a pulsed MHD converter for the production of electric power with a resistive load  
16 p0399 A77-40591
- ASHMUSSEN, J.  
Application study of wind power technology to the city of Hart, Michigan  
[COO-2603-1] 14 p0212 N77-17582
- ASPINES, J. D.  
Dynamic modeling and control of magnetohydrodynamic/steam electrical power generating plants  
15 p0332 A77-39572
- ASSAF, P. D.  
Santa Clara, California, community center, commercial solar demonstration legal alternatives, implications, and financing of solar heating and cooling by a municipal corporation  
[SAN/1083-76/1] 15 p0394 N77-27549
- ASSELMAN, G. A. A.  
Design considerations on a thermal energy storage Stirling engine automobile  
[SAE PAPER 770080] 16 p0424 A77-44558
- ATALLAH, S.  
Solar thermal power generation  
13 p0077 A77-19095
- ATHERTON, R. W.  
The analysis of subsidence associated with geothermal development. Volume 1: Handbook  
[PB-263692/6] 15 p0369 N77-24714
- The analysis of subsidence associated with geothermal development. Volume 2: Research report  
[PB-263693/4] 15 p0369 N77-24715
- The analysis of subsidence associated with geothermal development. Volume 3: Information bank  
[PB-263694/2] 15 p0369 N77-24716
- ATHEY, R.  
System study of fuels from grains and grasses  
[DSE/3729-1] 16 p0519 N77-29318
- ATKINS, L. A.  
Physical properties of western coal waste materials  
[PB-266724/4] 16 p0530 N77-30657
- ATKINSON, P. G.  
Mathematical modelling of single-phase nonisothermal fluid flow through porous media  
[PB-262884/0] 15 p0362 N77-24577
- ATTARI, A.  
Initial environmental test plan for source assessment of coal gasification  
[PB-261916/1] 15 p0350 N77-22705
- ATTENDU, H. C.  
Electric delivery vans above the 45th parallel in North America  
14 p0162 A77-22917
- ATWATER, M. A.  
Regional variations of solar radiation with application to solar energy system design  
[PB-259379/6] 14 p0226 N77-19708
- Regional variations of solar radiation with application to solar energy system design, user's manual  
[PB-259378/8] 14 p0234 N77-20676
- AUER, P. L.  
Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/  
13 p0013 A77-11524
- AUER, W. W.  
ERDA/USDA Agricultural Solar Thermal Energy Program  
16 p0470 A77-48921
- ERDA Solar Thermal Energy Program for industrial process heat  
16 p0470 A77-48922
- Proceedings of the Solar Industrial Process Heat Workshop  
[CONF-760655] 15 p0373 N77-25643
- AUGENSTEIN, D. C.  
Fuel gas recovery from controlled landfilling of municipal wastes  
13 p0070 A77-18739
- Packed bed digestion of solid wastes  
15 p0323 A77-39107
- AUREILLE, R.  
Possible applications of geothermal energy in France  
14 p0175 A77-24208
- AUSTIN, D.  
ERDA Interlaboratory Work for Data Exchange (IWGDE)  
[LBL-5329] 15 p0352 N77-22998
- AUSTIN, H. P.  
System performance of first residential solar installation in Charlottesville, Virginia, U.S.A. - Retrofitted indoor swimming pool  
16 p0479 A77-48999
- AUTHIER, B.  
Optical study of fixed spherical solar collectors  
16 p0505 A77-51161
- Optical study of fixed spherical solar collectors  
[LAS-PRC-76-01] 15 p0373 N77-25653
- AUXER, W. L.  
Development of a Stirling engine powered heat activated heat pump  
16 p0448 A77-48745
- AVERETT, D. E.  
Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges  
[PB-256691/7] 13 p0133 N77-15540
- AVERY, J. E.  
Low reflectivity solar cells  
[AD-A025922] 13 p0108 N77-12539
- AVERY, W.  
Applications of new systems to urban transportation  
14 p0137 A77-20392
- AVERY, W. H.  
Technical and economic feasibility of Ocean Thermal Energy Conversion  
16 p0481 A77-49018
- Design of low-cost aluminum heat exchangers for OTEC plant-ships  
16 p0485 A77-49046
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships  
[PB-255639/7] 13 p0109 N77-12552
- Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report  
[PB-257444/0] 13 p0116 N77-13554
- AVEZOV, R. R.  
Some features of the operation of a solar installation acting as a low-temperature source of heat for a heat pump  
13 p0015 A77-11924
- Calculation of the radiation entering a 'hot box' type solar set-up  
13 p0051 A77-14581

- Calculation of radiation entering 'hot box' solar unit  
15 p0291 A77-34975
- Development and testing of solar water-heating boilers manufactured by diffusion welding  
15 p0316 A77-37773
- Solar heating in residential houses in Uzbekistan  
15 p0316 A77-37774
- Development and testing of solar water-heater boilers fabricated by diffusion welding  
16 p0437 A77-47429
- Residential solar heating in Uzbekistan  
16 p0437 A77-47430
- AYER, P. A.  
Second Environmental Aspects of Fuel Conversion Technology Symposium  
[PB-257182/6]  
13 p0125 N77-14645
- AYERS, J. W.  
Design study of superconducting magnets for a combustion magnetohydrodynamic (MHD) generator  
[NASA-CR-135178]  
14 p0234 N77-20886
- AYRES, S. L.  
Role of the heat storage well future U.S. energy systems  
[PB-263480/6]  
15 p0367 N77-24634
- AYYAGAN, M. S.  
Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions  
14 p0162 A77-22978
- AYYASWAMY, P. S.  
Thermal energy storage considerations for solar-thermal power generation  
13 p0027 A77-12732
- AZEVEDO, J.  
Health effects of pollutants associated with fossil-fuel power generation: An indexed bibliography with abstracts  
[UCD-472-500]  
16 p0540 N77-31672
- ## B
- BABAEV, A. B.  
Contribution of the heat carried by solar radiation to the thermal balance of a room during the cold season and its effect on domestic fuel consumption  
13 p0063 A77-17558
- BABEL, H. W.  
Some material considerations involved in the application of solar energy to electric power generation  
13 p0049 A77-13739
- BABENKO, I. U. A.  
Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply  
15 p0272 A77-33170
- BACHMANN, K. J.  
Preparation of CdS/InP solar cells by chemical vapor deposition of CdS  
14 p0205 A77-29893
- InP-CdS solar cells  
15 p0259 A77-30740
- N-indium tin oxide/p-indium phosphide solar cells  
15 p0317 A77-38049
- BACKER, R. E.  
Physical properties of western coal waste materials  
[PB-266724/4]  
16 p0530 N77-30657
- BACKUS, C. E.  
On black solar cells or the tetrahedral texturing of a silicon surface  
13 p0004 A77-11000
- Photovoltaic systems using sunlight concentration  
13 p0076 A77-19089
- Considerations for using solar concentrators in photovoltaic systems  
16 p0460 A77-48835
- Characteristics of the concentrated solar flux produced by the PMSC prototype  
16 p0474 A77-48953
- BADER, A.  
Reduced drag, paraboloid type, solar energy collectors  
16 p0473 A77-48951
- BADER, C.  
Comparison of electric drives for road vehicles  
14 p0162 A77-22918
- BAER, R.  
The selectivity of absorbing layers  
14 p0202 A77-29565
- BAGOTSKII, V. S.  
New electrochemical current sources  
13 p0020 A77-12650
- BAHADORI, M. M.  
Thermal energy storage  
15 p0264 A77-31698
- BAHARI-KASHANI, M.  
Superflywheel energy storage and nonsynchronous AC/DC/AC electric transmission supplements power system operation  
13 p0002 A77-10638
- BAHR, L. M.  
Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5]  
16 p0516 N77-28610
- BAIBATYROV, E. M.  
Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte  
13 p0055 A77-15815
- BAILEY, B. M.  
Superconducting magnet development for the MHD program  
15 p0331 A77-39569
- BAILEY, J. A.  
Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings  
[PB-254665/3]  
13 p0091 N77-10689
- BAILEY, R. L.  
Energy saving potential of engine-electric vehicular drives  
13 p0025 A77-12708
- BAINBRIDGE, G. R.  
The energy problem and the earth's fuel situation  
13 p0004 A77-11027
- BAIRANOV, R.  
Tests of a combined wind and solar power plant under natural conditions  
15 p0294 A77-35415
- BAIRD, R.  
Radiolytic hydrogen production from a laser fusion system  
13 p0035 A77-12795
- BAIRIEV, A. CH.  
Calculations on an optimized faceted solar concentrator  
13 p0015 A77-11921
- BAKER, B. S.  
Fuel cell stacks  
[AD-A024216]  
13 p0090 N77-10684
- Fuel cell stacks  
[AD-A030375]  
14 p0213 N77-17603
- New materials for fluorosulfonic acid electrolyte fuel cells  
[AD-A036988]  
15 p0380 N77-26640
- Fuel cell stacks  
[AD-A037586]  
15 p0380 N77-26641
- BAKER, C. C.  
Review of the conceptual design of a doublet fusion experimental power reactor  
[ASME PAPER 76-WA/NE-9]  
14 p0188 A77-26494
- Characteristics of a first generation commercial fusion power plant  
[GA-A-13661]  
13 p0093 N77-10891
- BAKER, C. E.  
A study of the efficiency of hydrogen liquefaction  
15 p0279 A77-33377
- A study of the efficiency of hydrogen liquefaction  
14 p0240 N77-21611
- BAKER, M. S.  
The atypical Mathew solar house at Coos Bay, Oregon  
16 p0405 A77-41576
- BAKER, W. E.  
Update on the development of 120-keV multi-megawatt neutral beam source  
15 p0335 A77-39749
- BAKSHI, P. S.  
Study of gasoline vapor emission controls at small bulk plants  
[PB-267096/6]  
16 p0549 N77-32638
- BAKSHI, R. K.  
Methanol - A clean burning fuel for automobile engines  
14 p0205 A77-29930
- BAKUMENKO, V. D.  
Quasi-analog models of large systems of algebraic equations  
16 p0433 A77-46959

- BAL, J. T.**  
Regional variations of solar radiation with application to solar energy system design [PB-259379/6] 14 p0226 N77-19708
- BALAGNA, J.**  
Geothermal chemistry activities at LASL [LA-6448-PR] 15 p0344 N77-22623
- BALASUBRAMANIAN, M.**  
Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system 13 p0020 A77-12665
- BALCONB, J. D.**  
Simulation analysis of passive solar heated buildings - Preliminary results 16 p0406 A77-41582  
The current technology for solar heating and cooling 16 p0470 A77-48919  
A simplified method for calculating required solar collector array size for space heating 16 p0480 A77-49007
- BALDACCI, L.**  
Catalytic action of combustion-product deposits in the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the combustion chambers and exhaust channels of thermoelectric plants 16 p0420 A77-44179
- BALDRIDGE, P. E.**  
Development of a multi-disciplinary ERTS user program in the state of Ohio [E77-10045] 13 p0104 N77-12475
- BALDWIN, R. M.**  
Low-sulfur coal obtained by chemical desulfurization followed by liquefaction 13 p0008 A77-11242
- BALESTRA, C.**  
Thermionic converter performance with oxide collectors 16 p0466 A77-48888
- BALESTRA, C. L.**  
High efficiency thermionic converter studies [NASA-CR-135263] 16 p0546 N77-32592
- BALKE, R.-D.**  
Ground water as energy carrier 15 p0302 A77-36347
- BALL, D. A.**  
Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks [PB-262789/1] 15 p0371 N77-25551
- BALL, J. T.**  
Regional variations of solar radiation with application to solar energy system design, user's manual [PB-259378/8] 14 p0234 N77-20676
- BALLANCE, J. W.**  
Integration of solar generation into electric utility systems [AIAA 77-1020] 16 p0404 A77-41562
- BALLANTYNE, W. E.**  
Production and processing of US tar sands: An environmental assessment [PB-266266/6] 16 p0513 N77-28575
- BALLARD, J. L.**  
Operations research investigations of satellite power stations [NASA-TN-X-73372] 14 p0236 N77-21547
- BALTISBERGER, R. J.**  
Catalytic hydrogenation of solvent-refined lignite to liquid fuels 13 p0008 A77-11243
- BALUEV, E. D.**  
Utilization of disposed petroleum products and industrial wastes as fuels 14 p0167 A77-23404
- BANBANK, R. A.**  
Developing and testing of a wastewater recycler and heater [NASA-CR-154846] 16 p0531 N77-31040
- BANNER, K.**  
The helium turbine - A power station of the future 14 p0138 A77-20951
- BANAS, J. F.**  
Engineering development status of the Darrieus wind turbine 14 p0166 A77-23365
- BANCHEK, I. W.**  
Winkler technology for clean fuels from coal 15 p0301 A77-36337
- BANCROFT, B. A.**  
The strategic petroleum reserve and liquefied natural gas supplies [PB-265488/7] 16 p0520 N77-29598
- BANI, J.**  
Performance analysis of a solar-electrical system with a load and storage batteries 14 p0177 A77-24570
- BANKS, P. M.**  
The Tethered Balloon Current Generator - A space shuttle-tethered subsatellite for plasma studies and power generation 14 p0184 A77-26200
- BANKWITZ, H.**  
Development of a vertical axis wind turbine (phase 1) [BMFT-FB-T-76-55] 14 p0209 N77-17112
- BANNA, S. M.**  
The formation of nitrogen oxides from fuel nitrogen [PB-252462/7] 13 p0092 N77-10717
- BANNEROT, H. B.**  
Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials 13 p0068 A77-18444  
Optimum solar collector operation for maximizing cycle work output 15 p0255 A77-30313  
Predicted daily and yearly average radiative performance of optimal trapezoidal groove solar energy collectors 16 p0472 A77-48943  
The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors 16 p0502 A77-50214  
The evaluation of surface geometry modification to improve the directional selectivity of solar energy collectors [PB-258848/1] 14 p0233 N77-20618
- BANNOCHIE, J. G.**  
Application of the Alstom/Exxon alkaline fuel cell system to utility power generation [EPRI-EM-384] 16 p0557 N77-33643
- BANSAL, G. K.**  
Experimental screening of carbon-base materials for impact members in isotopic heat sources [BNI-X-673] 15 p0396 N77-27901
- BANY, J.**  
The influence of parameter dispersion of electrical cells on the array power output 16 p0420 A77-44264  
Array power output of non-identical electrical cells 16 p0468 A77-48903
- BARANOV, V. K.**  
Characteristics of a system for transmitting concentrated solar radiation 13 p0051 A77-14578  
Method of designing profiles of focusing concentrators and focusing wedges 14 p0179 A77-25355  
Combination of focusing concentrators and focusing lenses 15 p0286 A77-33431  
Features of systems for transmission of concentrated solar radiation 15 p0290 A77-34972  
Concentration of scattered radiation 15 p0316 A77-37768  
Method for calculating the profiles of focons and foclines 16 p0409 A77-41905  
Combination of focons and foclines with radiation receivers 16 p0427 A77-45544  
Concentration of diffuse radiation 16 p0437 A77-47424  
Shortened focusing concentrators and focusing wedges 16 p0442 A77-48521
- BARANOVA, R. KH.**  
Potentialities of electric energy production by means of thermoelectric generators 14 p0154 A77-21847
- BARAONA, C. R.**  
Analysis of epitaxial drift field N on P silicon solar cells [NASA-TN-X-73563] 13 p0106 N77-12523

- BARATSABAL, P.  
Solar energy in the building 15 p0303 A77-36411
- BARATZ, B.  
Survey of alcohol fuel technology, volume 1  
[PB-2560C7/6] 13 p0112 N77-13232
- BARBER, E. A.  
Innovative Aircraft Design Study (IADS) task 2,  
volume 1  
[AD-A041234] 16 p0531 N77-31141
- BARBER, R. E.  
Solar powered organic Rankine cycle engines -  
Characteristics and costs 13 p0036 A77-12798
- BARBER, S. C.  
Availability of potential coal supply through 1985  
by quality characteristics  
[PB-256680/0] 13 p0121 N77-14573
- BARBER, T.  
Studies of helical conductor models for  
superconducting ac power transmission  
[BNL-21784] 14 p0236 N77-21332
- BARENKOV, V. A.  
A microwave energy converter with a reversing  
magnetic field 14 p0139 A77-21154
- BARFIELD, E. P.  
Solar economics in Illinois 16 p0497 A77-49152
- BARGMAN, R. D.  
Fuel gas and electricity from municipal sewage 15 p0314 A77-37658
- BARKALOV, B. N.  
Oxidation-erosion of materials in high velocity  
hot gases 15 p0270 A77-32604
- BARNERT, H.  
The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich 15 p0273 A77-33328
- BARNES, J. A.  
The pressure divider - A device for reducing  
gas-pipe-line pumping-energy requirements 13 p0028 A77-12735
- BARNES, R. H.  
MHD combustor effluent chemistry measurements  
using Raman scattering 16 p0425 A77-44825
- BARNES, R. T.  
CDIF combustor design  
[TID-27143] 15 p0377 N77-26393
- BARNETT, A. M.  
Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell 15 p0258 A77-30721
- BARNETT, J. P.  
Analysis of solar energy system for the GSA  
demonstration office building at Manchester, New  
Hampshire  
[PB-254179/5] 13 p0091 N77-10687
- Comparison of computer-predicted and observed  
energy uses in a multi-family high-rise  
apartment building  
[PB-267829/0] 16 p0539 N77-31665
- BARNETT, S. H.  
Energy from solid waste utilization; Proceedings  
of the Sixth Annual Northeastern Regional  
Antipollution Conference on a New Source of  
Materials, Energy and Jobs - Solid Wastes  
Processing, University of Rhode Island,  
Kingston, R.I., July 8, 9, 1975 16 p0433 A77-47210
- BARON, B.  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film  
polycrystalline photovoltaic device for  
terrestrial applications 16 p0486 A77-49059
- BARON, R. E.  
Synthetic fuels - Prices, prospects, and prior art 13 p0017 A77-12236
- BARON, S.  
Air, water, nuclear power make gasoline 13 p0045 A77-12935
- Synthetic carbonaceous fuel and feedstock using  
nuclear power, air and water 15 p0321 A77-38532
- BARB, I. B.  
Production of methane using offshore wind energy 13 p0026 A77-12722
- BARBA, O.  
Efficiency tests on a linear parabolic  
concentrator for medium and high temperatures  
13 p0077 A77-19103
- Simulation of the performance of a solar energy  
plant using uniaxial parabolic collectors, with  
a one-degree-of-freedom pointing system, at  
different latitudes 14 p0164 A77-43297
- BARRETT, R. J.  
Accounting systems for energy conservation  
[LA-6569-MS] 16 p0557 N77-33646
- BARRICK, S. H.  
Investigating storage, handling, and combustion  
characteristics of solvent refined coal  
[PB-257557/9] 14 p0212 N77-17595
- BARRIE, L. A.  
Effects of anthropogenic emissions on climate - A  
review of selected topics 13 p0067 A77-18295
- BARSUKOV, V. V.  
Investigation of gas-controlled heat pipes with  
reservoirs of constant and variable volume 13 p0050 A77-14327
- BARTHEL, J. J.  
High temperature thermal energy storage 16 p0491 A77-49099
- Survey of high temperature thermal energy storage  
[SAND-75-8063] 13 p0088 N77-10655
- BARTHEL, W. J.  
Development of the modified in situ oil-shale  
process 14 p0193 A77-27342
- BARTELD, H.  
Burner criteria for NO<sub>x</sub> control. Volume 1:  
Influence of burner variables on NO<sub>x</sub> in  
pulverized coal flames  
[PB-259911/6] 14 p0234 N77-20639
- BARTICK, H.  
The production of shale oil crude and its refining  
into military operational fuels 15 p0292 A77-35155
- The production and refining of crude oil into  
military fuels  
[AD-A024652] 13 p0095 N77-11207
- BARTLETT, J. C.  
Long term performance prediction of residential  
solar energy heating systems 13 p0039 A77-12822
- BARTLETT, P. T.  
Development of procedures for the measurement of  
fugitive emissions  
[PB-263992/0] 15 p0368 N77-24671
- BARTON, J. P.  
An experimental investigation of fluctuating  
properties within a combustion MHD generator 15 p0330 A77-39559
- BARTOS, H. J., JR.  
Pollutant potential of raw and chemically fixed  
hazardous industrial wastes and flue gas  
desulfurization sludges  
[PB-256691/7] 13 p0133 N77-15540
- BARTSCH, H. J.  
Hybrid propulsion system for motor vehicles with  
predominantly intermittent mode of operation 14 p0171 A77-23900
- BASFORD, R. C.  
Design application using solar energy to control  
the environment in a major office building  
14 p0168 A77-23442
- Solar hot water systems application to the solar  
building test facility and the Tech House  
13 p0084 N77-10342
- The design of a solar energy collection system to  
augment heating and cooling for a commercial  
office building  
[NASA-TN-X-72753] 14 p0207 N77-16446
- BASHAM, W.  
The 1975 automotive characteristics data base  
[PB-262015/1] 15 p0354 N77-23507
- BASILIE, P. S.  
Energy demand studies: Major consuming countries.  
Analyses of 1972 demand and projections of 1985  
demand 16 p0428 A77-46094
- BASIULIS, A.  
VEP heat pipes for energy storage 13 p0032 A77-12767



- Heat pipes for hostile environments in energy conservation applications 16 p0450 A77-48758
- BASS, A.  
Projected natural gas curtailments and potential needs for additional alternate fuels, 1976-1977 heating season [PB-260535/0] 14 p0235 N77-21257
- BASS, J. C.  
An assessment of the materials needs for a Kr-85 fuel capsule 16 p0462 A77-48855
- BASS, R. L.  
A study to obtain verification of Liquid Natural Gas (LNG) tank loading criteria [AD-A025716] 13 p0120 N77-14492
- BASS, R. R.  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment [NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- BASSHAM, J. A.  
Covered energy farms for solar energy conversion [LNL-4844] 14 p0248 N77-21671
- BAST, J. A.  
Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825
- BASTE, D. B.  
North Slope oil and United States energy supply 15 p0309 A77-36823
- BATES, J. L.  
The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility 15 p0327 A77-39540  
Electrical conductivity of molten coal slags containing potassium seed 15 p0330 A77-39565  
Development and characterization of materials for open cycle MHD [BNWL-2004-3] 16 p0541 N77-31969
- BATY, J.  
On enthalpy management in small buildings 14 p0194 A77-27354  
Energy management in residential and small commercial buildings [BNL-50576] 15 p0392 N77-27511
- BATRA, S. K.  
Combined diesel-organic Rankine-cycle power plant 16 p0459 A77-48830
- BATTILLIER, J.-P.  
Solar energy in the building 15 p0303 A77-36411
- BATTEY, R. F.  
Engineering design and cost analysis of chlorine storage concepts for a zinc-chlorine load-leveling battery [PB-262016/9] 14 p0252 N77-21727
- BATTY, J. C.  
Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26] 16 p0432 A77-46909
- BAUER, R.  
Development of sodium/sulfur-cells 13 p0026 A77-12716  
Some studies on sodium/sulfur cells 13 p0055 A77-15813
- BAUSELLE, G.  
Storage of solar energy by inorganic oxide/hydroxides 16 p0492 A77-49109
- BAUERHEISTER, K.  
Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153
- BAUGHMAN, M. L.  
The future outlook for U.S. electricity supply and demand 15 p0286 A77-33496
- BAUGHN, J. W.  
Optimum concentration ratio for a solar central-receiver electric power plant 16 p0409 A77-41865
- BAUKAL, W.  
Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides 13 p0056 A77-15817
- BAUM, B.  
Investigation of test methods, material properties and processes for solar cell encapsulants [NASA-CR-155158] 16 p0550 N77-33347
- BAUM, I. V.  
Calculations on an optimized faceted solar concentrator 13 p0015 A77-11921  
Irradiation field formation on the receiver of 'precise' and 'unprecise' solar concentrators 13 p0057 A77-16209
- BAUM, V.  
High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851  
Manufacture of plastic foam concentrators and their characteristics 14 p0154 A77-21852
- BAUM, V. A.  
The problem of use of solar energy specific features of radiative, heat, and mass transfer in solar installations 13 p0057 A77-16204
- BAUMANN, H.  
Nonisothermal hydrogen-induced desulfurization of coal 15 p0287 A77-33544
- BAUMERISTER, P.  
A comparison of solar photothermal coatings 14 p0204 A77-29584
- BAIXER, W. A.  
Electrostatic precipitator design for western coals 16 p0504 A77-51148
- BAYAZITOGLO, Y.  
Heat and mass transfer analysis of Bacon-type hydrogen-oxygen fuel cells - The volume average velocity 15 p0321 A77-38531
- BAZAN, J.  
Coal fired non-equilibrium closed cycle MHD power plant system since ECAS 15 p0332 A77-39576
- BAZANT, E. P.  
Heat extraction from hot dry rock masses [PB-256775/8] 13 p0116 N77-13556  
Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 N77-28609
- BAZAROV, B.  
High-voltage photoelectric converters operating at high intensities of solar flux 14 p0154 A77-21851  
Manufacture of plastic foam concentrators and their characteristics 14 p0154 A77-21852
- BAZAROV, B. A.  
Experimental facility for measuring spatial and energy characteristics of solar concentrators 14 p0179 A77-25356  
Fabrication of solar energy concentrators based on polyurethane foams using new polyol and isocyanate compounds 15 p0271 A77-32973  
Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators 15 p0316 A77-37767  
Experimental setup for measuring space and energy characteristics of solar concentrators 16 p0409 A77-41906  
Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators 16 p0437 A77-47423
- BAZQUES, E. O.  
Short and long term comparison of solar absorption air-conditioning system performance using real and synthetic weather data 13 p0039 A77-12824
- BEACHELEY, M. H.  
The fuel efficiency potential of a flywheel hybrid vehicle for urban driving 13 p0020 A77-12664

- Continuously-variable transmission concepts  
suitable for flywheel hybrid automobiles  
16 p0444 A77-48705
- Increased fuel economy in transportation systems  
by use of energy management: Second year's  
program. Executive summary  
[PB-256117/3] 13 p0108 A77-12536
- Increased fuel economy in transportation systems  
by use of energy management - second year's  
program  
[PB-257177/6] 13 p0133 A77-15930
- BEADLE, P. C.  
Stratospheric heating due to absorption of solar  
radiation by NO<sub>2</sub>  
13 p0013 A77-11568
- BEAN, J. E.  
Demonstration testing of a Vuilleumier cryocooler  
with an integral  
[AD-A042786] 16 p0547 A77-32599
- BEAN, J. W.  
Analysis of solar energy system for the GSA  
demonstration office building at Manchester, New  
Hampshire  
[PB-254179/5] 13 p0091 A77-10687
- BEARD, J. T.  
Analysis of thermal performance of 'Solaris'  
water-trickle solar collector  
[ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526
- Performance and analysis of 'Solaris'  
water-trickle solar collector  
16 p0472 A77-48939
- Performance and analysis of SOLARIS water-trickle  
solar collector  
[CONF-760821-9] 14 p0232 A77-20599
- Analysis of thermal performance of Solaris  
water-trickle solar collector  
[CONF-761107-17] 15 p0382 A77-26668
- Evaluation of Solaris water-trickle solar  
collector and demonstration of annual cycle  
collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 A77-26669
- Engineering analysis and testing of water-trickle  
solar collector  
[ORO-4927-76-2] 15 p0391 A77-27506
- BEARD, T. E.  
In-place recovery of multiple products from  
Colorado's saline-mineral-bearing Piceance Basin  
14 p0193 A77-27344
- BEARDSWORTH, E.  
Technical and economic aspects of potential US  
district heating systems  
[BNL-21287] 14 p0232 A77-20594
- Technical and economic feasibility of US district  
heating systems using waste heat from fusion  
reactors  
[BNL-50516] 14 p0232 A77-20606
- BEATON, M.  
Investigation of factors influencing potassium  
seed recovery in a direct coal-fired generator  
system  
15 p0331 A77-39570
- BEATON, M. S.  
Slag layers in direct coal-fired MHD power  
generation  
14 p0139 A77-21224
- Generator wall slag coating and material corrosion  
experiments  
15 p0327 A77-39542
- BEATTY, E. C.  
Applied research in the general area of charged  
particle chemistry related to coal-fired MHD  
[PB-263873/2] 15 p0387 A77-26987
- BEAUFRE, J. H.  
Electric delivery vans above the 45th parallel in  
North America  
14 p0162 A77-22917
- BEAUFRE, A.  
A hydrogen-halogen energy storage system for  
electric utility applications  
16 p0457 A77-48818
- Hydrogen for energy storage: A progress report of  
technical developments and possible applications  
[BNL-20931] 13 p0094 A77-11201
- Hydrogen storage, water electrolysis and fuel  
cells for electric energy storage  
[BNL-21498] 15 p0344 A77-22620
- Hydrogen-halogen energy storage system:  
Preliminary feasibility and economic assessment  
[BNL-22164] 16 p0537 A77-31635
- BEAUFRE, A. H.  
Hydrogen storage via iron-titanium for a 26 MW/e/  
peaking electric plant  
13 p0048 A77-13543
- BEBBINGTON, W. P.  
The reprocessing of nuclear fuels  
13 p0055 A77-15807
- BESOUT, D. G.  
Geology and potential uses of the geopressure  
resources of the Gulf Coast  
[UCID-17163] 14 p0215 A77-18562
- Proceedings of Second Geopressed Geothermal  
Energy Conference. Volume 2: Resource Assessment  
[CONF-760222-P2] 14 p0249 A77-21677
- BECHTOFT NIELSEN, P.  
Solar-powered refrigeration by intermittent solid  
absorption systems  
13 p0078 A77-19106
- BECK, C.  
Biomass energy for Hawaii. Volume 1 - Summary and  
background. Volume 2 - Sugar operations. Volume  
3 - Mixed municipal refuse. Volume 4 -  
Terrestrial and marine plantations  
16 p0428 A77-46250
- BECK, F. W. H.  
Outer continental shelf oil and gas costs and  
production volume: Their impact on the nation's  
energy balance to 1990  
[PB-262533/3] 15 p0343 A77-22604
- BECKER, F. E.  
Ignition and combustion behavior of pulverized  
coal jets in hot oxidizing atmospheres  
15 p0331 A77-39568
- BECKER, L.  
Recent experimental studies of the interaction of  
potassium seed with coal slag in a direct-coal  
fired MHD generator  
14 p0141 A77-21250
- Investigation of factors influencing potassium  
seed recovery in a direct coal-fired generator  
system  
15 p0331 A77-39570
- Analysis of information systems for hydropower  
operations: Executive summary  
[NASA-CR-149342] 13 p0122 A77-14586
- Analysis of information systems for hydropower  
operations  
[NASA-CR-149373] 13 p0129 A77-15497
- BECKER, M.  
Electric energy alternatives appraisal for New  
York State  
16 p0413 A77-42632
- Electric energy supply alternatives for New York.  
Phase 2: An appraisal of electrical energy  
alternatives available to the State of New York  
[PB-249881/4] 13 p0101 A77-11575
- Environmental protection measuring technique.  
Sensor for automatic continuous emission control  
of gases  
[BHPT-PB-T-76-03] 14 p0209 A77-16467
- Accounting systems for energy conservation  
[LA-6569-MS] 16 p0557 A77-33646
- BECKMAN, W. A.  
Solar heating in the United States  
[ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513
- Simulation study of several solar heating systems  
with offpeak auxiliary  
16 p0406 A77-41587
- Simulation study of several solar heating systems  
with offpeak auxiliary  
16 p0479 A77-49001
- A design procedure for solar air heating systems  
16 p0480 A77-49006
- A parametric study of critical fuel costs for  
solar heating in North America  
16 p0493 A77-49118
- A design procedure for solar air heating systems  
16 p0501 A77-50209
- Simulation study of several solar heating systems  
with offpeak auxiliary  
[CONF-760842-13] 15 p0393 A77-27534
- Review of solar cooling  
[CONF-760842-9] 15 p0393 A77-27535
- Design procedure for solar air heating systems  
[CONF-760842-14] 16 p0514 A77-28589
- BEDINGER, A. P.  
The solar fan - Solar induced draft air  
conditioning system  
16 p0478 A77-48988

- BEECHER, D. T.**  
 Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 1: Summary and combined gas-steam turbine plant with an integrated low-BTU gasifier [NASA-CR-134942-VOL-1] 15 p0379 N77-26628  
 Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 2: Summary and combined gas-steam turbine plant using coal derived liquid fuel [NASA-CR-134942-VOL-2] 15 p0379 N77-26629  
 Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 3: Summary and advanced steam plant with pressurized fluidized bed boilers [NASA-CR-134942-VOL-3] 15 p0379 N77-26630
- BEEHLEY, D. C.**  
 Performance of an evacuated tubular collector using non-imaging reflectors 16 p0472 A77-48940
- BEERS, E.**  
 Choosing an electrical energy future for the Pacific northwest: An alternative scenario [PB-264048/0] 15 p0375 N77-25674
- BENSON, J. L.**  
 Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [PB-2307-2] 14 p0224 N77-19637
- BEHLING, D. J., JR.**  
 Relationship of energy growth to economic growth under alternative energy policies [BNL-50500] 14 p0223 N77-19620  
 Dynamics systems analysis of the relation between energy and the economy [BNL-21667] 14 p0235 N77-20931  
 Effects of alternative oil stockpiling programs on the US economy, 1976-1979 [BNL-50541] 15 p0369 N77-24999
- BEHN, E.**  
 Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors 16 p0418 A77-43049
- BEHRN, E.**  
 California energy outlook [UCRL-5156-REV-1] 13 p0106 N77-12525
- BEILIS, I. I.**  
 Cathode spots on metallic electrodes of an MHD-channel 15 p0269 A77-32518
- BEJAN, A.**  
 Thermal performance of the rotor of the MIT-EPRI 3 MVA superconducting alternator 14 p0144 A77-21384
- BEKHUKHANBETOV, E. S.**  
 Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies 13 p0018 A77-12361
- BELCHER, G.**  
 Power supplies for full time fly-by-wire aircraft control systems 15 p0320 A77-38461
- BELDING, J. A.**  
 Alternatives to oil and gas through energy management [AIAA 77-1006] 16 p0403 A77-41553
- BELL, K. J.**  
 Heat exchangers for the Ocean Thermal Energy Power Plant 14 p0176 A77-24219
- BELL, R. O.**  
 Enhancement of diffusion length in EFG ribbon solar cells under illumination 16 p0503 A77-50293
- BELLOWS, R. J.**  
 Application of the Alstom/Exxon alkaline fuel cell system to utility power generation [EPRI-EM-384] 16 p0557 N77-33643
- BELOUST, C.**  
 Deposition of polycrystalline silicon solar cells 13 p0076 A77-19082
- BELOV, A. I.**  
 Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator 14 p0136 A77-20109  
 Investigating the starting modes of the GT-35 gas turbine plant 16 p0426 A77-45324
- BELTEKY, L.**  
 Problems related to operating thermal wells subject to scaling in Hungary 14 p0163 A77-23035
- BELIKH, A. D.**  
 Shock tube for investigations of high-temperature MHD generators 13 p0054 A77-15665
- BEN-BASSAT, M.**  
 Development of signal processing algorithms for ultrasonic detection of coal seam interfaces [NASA-CR-150024] 13 p0085 N77-10610
- BEN-DAVID, S.**  
 Solar energy: Policy and prospects [PB-267986/8] 16 p0554 N77-33620
- BENCH, B. M.**  
 Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] 16 p0527 N77-30589
- BENDAWIEL, D. J.**  
 An econometric analysis of energy over the next 75 years 16 p0414 A77-42637
- BENDER, D. J.**  
 Mirror hybrid reactor optimization studies [UCRL-78614] 14 p0253 N77-21939
- BENDIK, M. T.**  
 Experimental study of several modes of operation of a laboratory section of a three-phase superconducting power transmission cable 16 p0438 A77-47753
- BENDORAITIS, J. G.**  
 Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids 14 p0145 A77-21623
- BENDOV, Y.**  
 Analysis of the California energy industry [LBL-5928] 16 p0557 N77-33640
- BENEMANN, J. R.**  
 The photosynthesis energy factory - Analysis, synthesis, and demonstration 16 p0449 A77-48753
- BENENSON, P.**  
 A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results [PB-252485/8] 13 p0088 N77-10662  
 A linear economic model of fuel and energy in the United States. Volume 2: Submodels and data [PB-252486/6] 13 p0089 N77-10663  
 Analysis of the California energy industry [LBL-5928] 16 p0557 N77-33640
- BENESH, P. H.**  
 Growth effects of major land use projects. Volume 2: Compilation of land use based emission factors [PB-255302/2] 13 p0092 N77-10709
- BENFORD, J.**  
 Electron beam heated solenoid reactors for fusion power and fissile fuel breedings 16 p0459 A77-48827
- BENINGTON, H.**  
 Public participation in energy related decision making, edited transcripts [PB-268781/2] 16 p0559 N77-33674
- BENJAMIN, T. G.**  
 Thermal efficiency of solid electrolyte fuel cells with mixed conduction 16 p0500 A77-50199
- BENNETT, E.**  
 Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576
- BENNETT, L. E.**  
 The electron factor in catalysis on metals electrocatalysis on non-metallic surfaces [PB-256264/3] 13 p0103 N77-12166
- BENNETT, R. P.**  
 Chemical reduction of SO<sub>3</sub>, particulates and NO<sub>x</sub> emissions 15 p0294 A77-35188
- BENNETT, V. R.**  
 Oil and gas use characterization, impacts, and guidelines [PB-265267/5] 16 p0516 N77-28610

- BENHISON, R.**  
The use of composite flywheels for braking energy recovery in road transport vehicles  
16 p0401 A77-41351
- BENSERMAN, R. P.**  
Solar energy can be self-supporting long-term energy storage  
15 p0261 A77-31371
- BENSON, P. A.**  
Electric arc power collection for high-speed trains  
13 p0060 A77-16594
- BENSON, G. B.**  
Free-piston heat pumps  
16 p0449 A77-48748  
Thermocorer for geothermal applications  
16 p0456 A77-48811  
Thermal oscillators  
16 p0465 A77-48879
- BENSON, H.**  
Geochemistry and hydrothermal alteration at selected Utah hot springs, volume 3  
[PB-264415/1]  
15 p0378 A77-26606
- BENSON, R.**  
Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies  
[AD-A034995]  
15 p0377 A77-26491
- BENSON, S. W.**  
Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal  
16 p0442 A77-48489
- BENSON, W.**  
System study of fuels from grains and grasses  
[DSE/3729-1]  
16 p0519 A77-29318
- BENTLEY, H.**  
Hydrogen energy conversion  
[AD-A030370]  
14 p0218 A77-18601
- BENVENUTI, R.**  
Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants  
16 p0420 A77-44178
- BERCHOWITZ, D. H.**  
A new mathematical model for Stirling cycle machines  
16 p0465 A77-48884  
A new ported constant volume external heat supply regenerative cycle  
16 p0465 A77-48885
- BERDING, K.**  
Health effects of pollutants associated with fossil-fuel power generation: An indexed bibliography with abstracts  
[UCD-472-500]  
16 p0540 A77-31672
- BEREZHIANSKII, A. I.**  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method  
[BLL-M-25448-(5828.4F)]  
13 p0112 A77-13235
- BEREZIN, I. V.**  
Conversion of solar energy by photosynthetic production of molecular hydrogen  
14 p0143 A77-21316
- BERGAUX, G. V.**  
Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels  
[BLL-M-25473-(5828.4F)]  
15 p0359 A77-24245
- BERGER, B. J.**  
Biosolar production of fuels from algae  
[UCRL-52177]  
16 p0511 A77-28323
- BERGER, H.**  
International law and solar energy satellites  
[IAP PAPER SI-77-52]  
16 p0508 A77-51561
- BERGMAN, P. D.**  
Utilization of Western coal for MHD energy conversion  
14 p0140 A77-21230  
Economic and energy considerations in MHD seed regeneration  
15 p0332 A77-39574
- BERGHARK, W. B.**  
Photon energy storage in organic materials: The case of linked anthracenes  
[AD-A039702]  
16 p0535 A77-31615
- BERGQUAN, J. B.**  
Optimum concentration ratio for a solar central-receiver electric power plant  
16 p0409 A77-41865
- BERKOWITZ, D. A.**  
Dynamic modeling of fluidized bed boilers for control system design  
16 p0454 A77-48792
- BERKOWITZ, M.**  
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine  
[NASA-CR-135119]  
15 p0376 A77-26134
- BERLAD, A. L.**  
On enthalpy management in small buildings  
14 p0194 A77-27354  
Energy management in residential and small commercial buildings  
[BNL-50576]  
15 p0392 A77-27511
- BERLINSKI, P.**  
Precipitation and scaling in dynamic geothermal systems  
[ORNL-TM-5649]  
14 p0249 A77-21680
- BERMAN, P. A.**  
Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature  
[NASA-CR-155166]  
16 p0553 A77-33604
- BERMAN, S. B.**  
Investment planning in the energy sector  
[LBL-4474]  
13 p0125 A77-14948
- BERNARD, J.**  
Photovoltaic properties of thin-film Cu<sub>2</sub>S-CdS heterojunctions  
14 p0149 A77-21801  
Efficiency of photovoltaic cells employing Schottky diodes  
14 p0151 A77-21815
- BERNARDINI, C.**  
Design and testing of planar solar collectors  
14 p0164 A77-23298
- BERNDORFER, K.**  
Development of a 10 kWe solar thermal power station  
14 p0154 A77-21844
- BERNHARDT, W.**  
Combustion technology for the improvement of engine efficiency and emission characteristics  
16 p0440 A77-48172
- BERNSTEIN, G. J.**  
Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion  
14 p0161 A77-22910
- BERNSTEIN, H.**  
Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864  
Personal rapid transit research conducted at the Aerospace Corporation  
[PB-256846/7]  
13 p0111 A77-12946
- BERNSTEIN, I. H.**  
Selection of structural materials for hydrogen pipelines and storage vessels  
15 p0281 A77-33390  
Selection of structural materials for hydrogen pipelines and storage vessels  
14 p0243 A77-21625
- BERTHOUEX, P. H.**  
Strategy of pollution control  
16 p0400 A77-40673
- BERTONCINI, P.**  
Plasma heating systems planned for the Argonne experimental power reactor  
16 p0407 A77-41712
- BERTONCINI, P. J.**  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11]  
14 p0188 A77-26496  
Tokamak experimental power reactor  
[CONF-761107-23]  
15 p0397 A77-27946
- BERTSCHINGER, G.**  
Schlieren measurements of a high density z-pinch  
13 p0060 A77-16697
- BERZHATYI, V. I.**  
Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies  
13 p0018 A77-12361
- BESANT, R. W.**  
Cost effective solar heating of houses with seasonal storage of energy  
16 p0481 A77-49016

- BESSEY, M.**  
Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576
- BESSON, J. M.**  
Photovoltaic properties of GaSe and InSe junctions 15 p0289 A77-34117
- BEST, J. S.**  
Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 N77-20616
- BEST, R. W. B.**  
Clean fusion concepts and efforts - A survey 16 p0435 A77-47356
- BETTIHI, M.**  
Preparation of CdS/InP solar cells by chemical vapor deposition of CdS 14 p0205 A77-29893  
InP-CdS solar cells 15 p0259 A77-30740
- BETZ, J. M.**  
Fuel gas and electricity from municipal sewage 15 p0314 A77-37658
- BETZER, P. R.**  
Black magnetic spherule fallout in the eastern Gulf of Mexico 13 p0052 A77-14890
- BEVERLY, W. D.**  
Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant 16 p0461 A77-48842
- BEYRON, E.**  
Inhibited ethylene glycol as the solar nexus 15 p0270 A77-32601
- BEZDEK, R. H.**  
Prospectus on commercialization of solar heating and cooling systems 16 p0470 A77-48920  
Incentives and barriers to the development of solar energy 16 p0494 A77-49119
- BEZRODNYI, N. K.**  
Investigation of the 'crisis' of heat and mass transfer in low-temperature wickless heat pipes 15 p0316 A77-37927
- BHAT, D. M.**  
Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells 16 p0420 A77-44059
- BHATNAGAR, P. K.**  
Spectral response of a laterally illuminated p-n junction 13 p0062 A77-17478
- BHAVARAJU, M. P.**  
Economic assessment of the utilization of fuel cells in electric utility systems [AIAA 77-1012] 16 p0403 A77-41559  
Economic assessment of the utilization of fuel cells in electric utility [EPRI-EM-336] 15 p0392 N77-27516
- BIAGI, L. A.**  
Update on the development of 120-keV multi-megawatt neutral beam source 15 p0335 A77-39749
- BIANCARDI, F. R.**  
A unique Rankine-cycle heat pump system 13 p0036 A77-12799
- BIBERMAN, L. M.**  
Some results of MHD-laser investigation 15 p0328 A77-39549
- BIBLAKZ, O.**  
A simplified technique for determining the boundary layer voltage loss in MHD generators 16 p0416 A77-42897
- BIDARD, R.**  
Modern technology electrolysis for power application 15 p0278 A77-33364  
Modern technology electrolysis for power application 14 p0239 N77-21598
- BIDARD, R. A.**  
Thermolysis or electrolysis - Why we choose the latter 15 p0321 A77-38528
- BIEDERMAN, W.**  
Energy transmission from ocean thermal energy conversion plants 13 p0032 A77-12773
- Ocean thermal energy delivery systems based on chemical energy carriers 15 p0279 A77-33375
- Commodity hydrogen from off-peak electricity 15 p0283 A77-33403
- BIEDERMAN, H. P.**  
Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock 14 p0200 A77-29437  
A farm energy system employing hydrogen storage 15 p0278 A77-33366  
Wind-powered hydrogen electric systems for farm and rural use [PB-259318/4] 14 p0226 N77-19667  
A farm energy system employing hydrogen storage 14 p0239 N77-21600  
Ocean thermal energy delivery systems based on chemical energy carriers 14 p0240 N77-21609  
Commodity hydrogen from off-peak electricity 14 p0245 N77-21641
- BIEHL, R. A.**  
The annual cycle energy system - A hybrid heat pump cycle 16 p0408 A77-41823
- BIENERT, W. B.**  
Heat pipes in flat plate solar collectors [ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517  
Development of a jet pump-assisted arterial heat pipe [NASA-CR-152015] 16 p0527 N77-30415
- BIENSTOCK, D.**  
Utilization of Western coal for MHD energy conversion 14 p0140 A77-21230  
Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251  
Combustion of pulverized, solvent-refined coal [ASME PAPER 76-WA/FU-6] 14 p0185 A77-26456  
Symposium on the Engineering Aspects of Magnetohydrodynamics, 16th, University of Pittsburgh, Pittsburgh, Pa., May 16-18, 1977, Proceedings 15 p0325 A77-39526  
Economic and energy considerations in MHD seed regeneration 15 p0332 A77-39574
- BIGGS, F.**  
Mathematical modeling of solar concentrators 16 p0473 A77-48949
- BILGER, G.**  
Technology of large area Cu/x/S-CdS solar cells 14 p0149 A77-21798
- BILLIG, F. S.**  
Direct-connect tests of hydrogen-fueled supersonic combustors 16 p0440 A77-48240
- BILLING, J. R.**  
Application of gravitational energy exchange to tracked urban transit systems 14 p0200 A77-29468
- BILLINGS, R. R.**  
Survey of hydrogen energy application projects 13 p0033 A77-12778  
A hydrogen-powered mass transit system 15 p0282 A77-33400  
A comparison of operational economics of transportation vehicles operated on gasoline and coal-generated hydrogen 15 p0302 A77-36343  
A hydrogen-powered mass transit system 14 p0244 A77-21638
- BINDER, U. W.**  
Emissions from compressor stations 15 p0287 A77-33545
- BIRCHENALL, C. E.**  
Thermal storage in metals 16 p0492 A77-49105
- BIRD, A. W., JR.**  
Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station 16 p0504 A77-51135
- BIRD, W.**  
Pulsed energy and switching requirements for Tokamak ohmic heating [LA-UR-76-2473] 15 p0397 N77-27932

- BIRK, J.  
Evaluation of a 1 kWh zinc chloride battery system  
[PB-260683/8] 14 p0236 N77-21356
- BIRK, J. R.  
Storage batteries - The case and the candidates  
[AIAA 77-1007] 16 p0303 A77-41554  
Sodium chloride battery development program for  
load leveling  
[PB-257570/2] 14 p0208 N77-16456
- BIRMINGHAM, A. D.  
Electric power development in the Pacific  
Northwest Region: Institutional commitments and  
alternatives, phase 1  
[PB-262382/5] 15 p0348 N77-22671
- BIRSIC, R. J.  
More about geothermal steam or the hottest energy  
prospect ever  
14 p0191 A77-26925
- BIRSS, R. W.  
Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 1: Digest of detailed data  
base descriptions  
[UCID-17316-PT-1] 15 p0387 N77-27036  
Transportation-related data bases extracted from  
the national index of energy and environmental  
data bases. Part 2: Detailed data base  
descriptions  
[UCID-17316-PT-2] 15 p0387 N77-27037
- BISHOP, W. P.  
Environmental survey of the reprocessing and waste  
management portions of the LWR fuel cycle: A  
task force report  
[PB-258316/9] 14 p0209 N77-16879
- BISHOP, W. S.  
Electrochemical battery trends for aircraft and  
missile applications  
[AIAA PAPER 77-481] 14 p0172 A77-23901  
Development of nickel-zinc batteries for aircraft  
14 p0195 A77-28148
- BITER, W. J.  
Thin film solar cells for terrestrial applications  
[PB-255606/6] 13 p0109 N77-12553  
Thin film solar cells for terrestrial applications  
[PB-265963/7] 16 p0523 N77-29635
- BITURN, V. A.  
Influence of various losses on the characteristics  
of high-power MHD generators  
13 p0046 A77-13258  
Effect of various losses on the characteristics of  
powerful MHD generators  
15 p0263 A77-31538  
Investigation of two-dimensional electric effects  
in a sectional MHD-channel  
15 p0317 A77-37930  
A consideration of some three-dimensional effects  
in MHD channel  
15 p0330 A77-39560
- BITLEE, J. R.  
Computer graphics demonstration: Area coal  
availability studies  
[PB-267923/1] 16 p0541 N77-31824
- BITTNER, E.  
Heating of the Frascati Tokamak by means of quasi  
perpendicular neutral injection  
16 p0407 A77-41706
- BJORNSTAD, D. J.  
Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643
- BLACK, D. E.  
Horizontally mounted solar collector  
[NASA-CASE-MPS-23349-1] 16 p0529 N77-30613
- BLACK, D. L.  
Transient performance characteristics of a high  
temperature distributed solar collector field  
13 p0037 A77-12810
- BLACK, D. O.  
Energy recovery from solid waste: A review of  
current technology  
[PB-260633/3] 14 p0253 N77-22016
- BLACK, S. A.  
Supercorrodng alloys for generating heat and  
hydrogen gas  
16 p0458 A77-48820
- BLACKADAR, R.  
Kinetics of gasification in a combustion pot - A  
comparison of theory and experiment  
16 p0440 A77-48176
- BLACKSHEAR, F. L.  
Large-scale thermal storage in rock -  
Construction, utilization, and economics  
16 p0451 A77-48769
- BLACKSHEAR, F. L., JR.  
High-temperature energy storage in native rocks  
16 p0492 A77-49104
- BLACKWELL, B. F.  
The application of laminated wooden blades to a  
two-meter Darrieus type vertical axis wind turbine  
14 p0156 A77-22142  
Engineering development status of the Darrieus  
wind turbine  
14 p0166 A77-23365  
Wind tunnel performance data for the Darrieus wind  
turbine with NACA 0012 blades  
[SAND-76-0130] 14 p0214 N77-18057  
Status of the ERDA/Sandia 17-metre Darrieus  
turbine design  
[SAND-76-5683] 14 p0217 N77-18576  
Sandia vertical-axis wind turbine program  
[SAND-76-0338] 14 p0250 N77-21686  
Application of laminated wooden blades to a  
two-meter Darrieus type vertical axis wind turbine  
[SAND-75-0284] 16 p0521 N77-29614
- BLAIR, A. G.  
LASH hot dry rock geothermal project  
[LA-6525-PB] 15 p0372 N77-25639
- BLAIR, I. M.  
Aspects of energy conversion; Proceedings of the  
Summer School, Lincoln College, Oxford, England,  
July 14-25, 1975  
13 p0004 A77-11026
- BLAIR, J. F., JR.  
Some institutional problems of residential solar  
heating  
16 p0495 A77-49130
- BLAKE, F. A.  
One MW/th/ bench model cavity receiver steam  
generator  
14 p0158 A77-22642  
100 MWe solar power plant design configuration and  
performance  
[AAS 75-288] 15 p0305 A77-36556  
1 MWh solar cavity steam generator solar test  
program  
16 p0461 A77-48846  
Central receiver solar thermal power  
16 p0484 A77-49037
- BLANCHARD, C.  
Procedure for characterizing flat plate solar  
collectors  
13 p0073 A77-19056
- BLAND, J. S.  
Occupational radiation exposure at light water  
cooled power reactors, 1969-1975  
[PB-257054/7] 13 p0125 N77-14740
- BLANK, Z.  
An evaluation of the use of metal hydrides for  
solar thermal energy storage  
13 p0028 A77-12739
- BLANKENSHIP, J.  
Optimal drawdown strategy for strategic petroleum  
reserves  
[PB-265838/3] 16 p0512 N77-28569
- BLANK, D. E.  
Particulate sampling at high temperature and high  
pressure  
15 p0293 A77-35172
- BLATTENBERGER, G. R.  
Residential demand for energy, volume 1  
[EPRI-PA-235-VOL-1] 16 p0530 N77-30629
- BLATTNER, D. G.  
Innovative Aircraft Design Study (IADS) task 2,  
volume 1  
[AD-A041234] 16 p0531 N77-31141
- BLAUGHER, E. D.  
High speed superconducting generator  
14 p0144 A77-21383
- BLAZOWSKI, W. S.  
The impact of JP-4/JP-8 conversion on aircraft  
engine exhaust emissions  
[AD-A026546] 13 p0112 N77-13234
- BLECHER, W. A.  
Fuel gas environmental impact  
[PB-257134/7] 14 p0209 N77-16470

- BLEVINS, R. W.**  
Design of low-cost aluminum heat exchangers for  
OTEC plant-ships 16 p0485 A77-49046
- Maritime and construction aspects of Ocean Thermal  
Energy Conversion (CTEC) plant ships  
[PB-255639/7] 13 p0109 N77-12552
- Maritime and construction aspects of Ocean Thermal  
Energy Conversion (CTEC) plant ships, detailed  
report  
[PB-257444/0] 13 p0116 N77-13554
- BLICKENSDERFER, R.**  
Spectral reflectance of TiN/x/ and ZrN/x/ films as  
selective solar absorbers 16 p0423 A77-44492
- BLIDEN, H. R.**  
Assessment of satellite power stations  
[AIAA PAPER 77-552] 15 p0266 A77-32069
- BLIGH, T. P.**  
Large-scale thermal storage in rock -  
Construction, utilization, and economics  
16 p0451 A77-48769
- BLISS, R.**  
Direct contact heat exchangers for geothermal  
power plants 13 p0029 A77-12747
- BLOIS, S. O.**  
Patterns of energy use and the critical choices  
ahead 16 p0415 A77-42856
- BLOOM, A. M.**  
Application of heat pipes to ground storage of  
solar energy  
[AIAA PAPER 77-729] 15 p0324 A77-39507
- BLOOM, S.**  
Performance evaluation on the Owens-Illinois  
Sunpack solar energy collector  
[ASME PAPER 76-WA/SOL-16] 14 p0189 A77-26521
- BLOOMFIELD, H. S.**  
In-situ laser retorting of oil shale  
[NASA-CASE-LRW-12217-1] 14 p0214 N77-18429
- BLOOMQUIST, C. E.**  
Assessment of satellite power stations  
[AIAA PAPER 77-552] 15 p0266 A77-32069
- Survey of satellite power stations  
[DSE/2071-1] 16 p0532 N77-31225
- BLOOMSTER, C. H.**  
The potential national benefits of geothermal  
electrical energy production from hydrothermal  
resources in the West 13 p0031 A77-12760
- Economics of geothermal electricity generation  
from hydrothermal resources  
[BNWL-1989] 13 p0123 N77-14602
- Potential national benefits of geothermal  
electrical energy production from hydrothermal  
resources in the West  
[BNWL-SA-5798] 14 p0220 N77-19583
- Potential benefits of geothermal electrical  
production from hydrothermal resources  
[BNWL-2001] 14 p0221 N77-19591
- User manual for GEOCOST: A computer model for  
geothermal cost analysis. Volume 2: Binary  
cycle version  
[BNWL-1942-V2] 15 p0345 N77-22632
- Recommendations for a US geothermal research plan,  
volume 1  
[PB-261566/4] 15 p0346 N77-22640
- Recommendations for a US geothermal research plan.  
Volume 1: Appendix A: Glossary. Appendix B:  
Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641
- Recommendations for a US geothermal research plan.  
Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642
- Recommendations for a geothermal utilization plan,  
Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- BLOSS, W. H.**  
Technology of large area Cu/x/S-CdS solar cells  
14 p0149 A77-21798
- BLOSSER, E. R.**  
Chemical and physical characterization of  
automotive exhaust particulate matter in the  
atmosphere  
[PB-253375/0] 13 p0092 N77-10715
- BLOW, S. J.**  
An annotated bibliography, volume 1, appendix 2  
[NASA-TM-74765] 16 p0513 N77-28577
- An annotated bibliography, volume 2, appendix 2  
[NASA-TM-74764] 16 p0513 N77-28578
- BLUM, D.**  
Liquid phase methanol  
[PB-257615/5] 14 p0212 N77-17594
- BLUM, H. A.**  
Analytical and experimental treatment of a  
spray-on selective coating - Application to  
collector design 16 p0487 A77-49064
- BLUMENSTOCK, T.**  
Solar electricity for military applications  
15 p0289 A77-34113
- BOATWRIGHT, D. W.**  
Flight test evaluation of a method to determine  
the level flight performance of a  
propeller-driven aircraft  
[SAB PAPER 770470] 15 p0310 A77-37088
- BOBIN, J. L.**  
Hydrodynamics and compression of a laser  
irradiated target 14 p0146 A77-21745
- BOBIN, J.-L.**  
Lasers and controlled thermonuclear fusion. I  
14 p0135 A77-19918
- BOBROV, E. S.**  
Superconducting magnet development for the MHD  
program 15 p0331 A77-39569
- BOCCI, A. J.**  
A new series of aerofoil sections suitable for  
aircraft propellers 15 p0298 A77-36157
- BOCHENEK, E.**  
Non-nuclear energy technology. Low temperature  
cable for power transmission  
[BNFT-FB-T-76-01] 14 p0210 N77-17372
- BOCHKAREV, S. K.**  
Influence of the intended use of an aircraft on  
the optimal parameters of gas-turbine power plants  
15 p0266 A77-32086
- BOCKRIS, J. O.**  
The photosynthetic production of hydrogen  
14 p0239 N77-21602
- The theory of hydrogen production in a  
photoelectrochemical cell  
14 p0239 N77-21604
- BOCKRIS, J. O'M.**  
The theory of hydrogen production in a  
photoelectrochemical cell  
13 p0075 A77-19075
- The photosynthetic production of hydrogen  
13 p0075 A77-19077
- The photosynthetic production of hydrogen  
15 p0278 A77-33368
- The theory of hydrogen production in a  
photoelectrochemical cell  
15 p0279 A77-33370
- Cathodes for photodriven hydrogen generators -  
ZnTe and CdTe 15 p0296 A77-35921
- Theoretical treatment of the photoelectrochemical  
production of hydrogen  
15 p0321 A77-38530
- Hydrogen and electricity from water and light  
16 p0430 A77-46609
- BODEN, P. J.**  
Disposal of toxic wastes. I - Electroplating and  
electrochemical machining wastes. II - Poisonous  
and radioactive wastes 15 p0305 A77-36608
- BODNER, R. M.**  
Dutchess County, NY moves towards pyrolysis  
13 p0010 A77-11298
- BOECKHANN, A. P.**  
Collectors, pipelines, and heat storage units made  
of plastics 14 p0202 A77-29567
- BOER, K. W.**  
Sharing the sun: Solar technology in the  
seventies; Proceedings of the Joint Conference,  
Winnipeg, Canada, August 15-20, 1976. Volumes 1-10  
16 p0469 A77-48910
- Cds/Cu2S solar cells - A low-cost thin film  
polycrystalline photovoltaic device for  
terrestrial applications 16 p0486 A77-49059
- Payback of solar systems 16 p0493 A77-49115

- The solar spectrum at typical clear weather days  
16 p0501 A77-50212
- BOEGLY, W. J., JR.  
MUS systems analysis: Initial comparisons of  
modular-sized integrated utility systems and  
conventional systems  
[ORNL-RUD-MUS-6] 14 p0249 N77-21684
- BOEHL, J. E.  
Geothermal significance of magnetotelluric  
sounding in the eastern Snake River  
Plain-Yellowstone region 15 p0310 A77-36999
- BOEHM, H.  
Fuel cell assemblies with an acidic electrolyte  
13 p0055 A77-15816
- BOEHM, R.  
Direct contact heat exchangers for geothermal  
power plants 13 p0029 A77-12747
- BOEHM, R. P.  
Arrays of fixed flat-plate solar energy collectors  
- Performance comparisons for differing  
individual component orientations 13 p0068 A77-18449
- Heat transfer considerations of a nonconvecting  
solar pond heat exchanger  
[ASME PAPER 76-WA/SOL-4] 14 p0188 A77-26509
- Experimental measurements and system implications  
of the performance of flat plate solar collector  
configurations  
[ASME PAPER 76-WA/SOL-14] 14 p0189 A77-26519
- Calculation of long term solar collector heating  
system performance 15 p0255 A77-30311
- University of Utah direct contact Geothermal Power  
Project report. A computer program for  
determining the thermodynamic properties of water  
[UTEC-ME-76-171] 15 p0380 N77-26642
- BOENIG, H. J.  
Superconducting energy storage development for  
electric utility systems  
[LA-UR-76-2294] 15 p0381 N77-26649
- BOER, K. W.  
Direct solar energy conversion for large scale  
terrestrial use  
[PB-252539/2] 13 p0089 N77-10674
- BOERNER, H.  
The assurance of the heat supply with respect to  
the primary energy use in the case of heating  
and air conditioning installations 13 p0009 A77-11270
- BOES, E. C.  
Distribution of direct and total solar radiation  
availabilities for the USA 16 p0471 A77-48926
- Solar radiation availability to various collector  
geometries: A preliminary study  
[SAND-76-0009] 13 p0097 N77-11537
- Effects of spectral variations on silicon cell  
output  
[SAND-76-9142] 15 p0381 N77-26653
- Solar radiation availability for New Mexico  
[SAND-77-0004] 16 p0558 N77-33654
- BOESE, R. E.  
The advantages of sun tracking for planar silicon  
solar cells 14 p0181 A77-25904
- BOGAN, R. E.  
Fuels and chemicals from the sun through  
bioconversion 16 p0488 A77-49076
- BOGART, S. L.  
Current status of the magnetic fusion program  
13 p0035 A77-12792
- BOGERS, A. J.  
Hydrogen in the energy system of the Netherlands  
15 p0285 A77-33420
- Hydrogen in the energy system of The Netherlands  
14 p0247 N77-21660
- BOGUS, K.  
Assessment of high-efficiency solar cells  
performance 14 p0148 A77-21785
- BOHACHEVSKY, I. O.  
Heat transfer problems associated with laser fusion  
13 p0068 A77-18441
- BOHLMANN, E. G.  
Precipitation and scaling in dynamic geothermal  
systems 14 p0249 N77-21680
- BOIARCHENKO, V. I.  
Thermal explosion of moving reacting fluids of  
variable viscosity 13 p0052 A77-14980
- BOIARSKI, A. A.  
MHD combustor effluent chemistry measurements  
using Raman scattering 16 p0425 A77-44825
- BOISVERT, P. G.  
Chromatographic determination of adsorption and  
diffusion in a bidispersed porous solid  
[LBL-5273] 16 p0534 N77-31269
- BOKOVETS, A. P.  
Investigation of the mechanism of cleaning heating  
surfaces by the pulsation method  
[BLI-M-25448-(5828.4F)] 13 p0114 N77-13235
- BOLAN, P.  
Energy savings through on-site fuel cells in  
industrial applications 16 p0449 A77-44852
- BOLDIZSAR, T.  
Research and development of geothermal energy  
production in Hungary 14 p0163 A77-23034
- BOLLE, G.  
An automatic solar disk tracking system for  
incident energy measurements 14 p0138 A77-20749
- BOLSTAD, D. D.  
GDIST: A computer code for analysis of  
statistical distributions of physical data  
[PB-266762/4] 16 p0533 N77-31589
- BOLTA, C. C.  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- BOLTS, J. M.  
Photoassisted electrolysis of water - Conversion  
of optical to chemical energy 13 p0021 A77-12666
- BONAL, R.  
Energy budget for the year-round solar  
collector/storage system of a housing cluster  
situated in northern France 16 p0417 A77-42963
- BONAR, S.  
One MW/th/ bench model cavity receiver steam  
generator 14 p0158 A77-22642
- BONAR, S. H., JR.  
Georgia Tech 400 KWth solar thermal test facility  
16 p0498 A77-49158
- BONANNE, D. G.  
Utilization of low and intermediate BTU gas from  
coal for iron ore pelletizing  
[PB-264702/2] 15 p0389 N77-27247
- BONEWITZ, R. A.  
Application of aluminum alloys for solar heating  
and cooling systems 16 p0487 A77-49068
- BONNEHAY, M.  
A new hydrogen storage electrode 13 p0047 A77-13539
- BONNIN, MR.  
Problems relating to heat storage 14 p0152 A77-21826
- BOOBAR, H. G.  
Commercial applications of solar total energy  
systems 16 p0468 A77-48904
- BOOK, S. A.  
Health effects of pollutants associated with  
fossil-fuel power generation: An indexed  
bibliography with abstracts  
[UCD-472-500] 16 p0540 N77-31672
- BOONE, J. L.  
On the analysis and design of grid structures for  
p-n junction solar cells 16 p0497 A77-49156
- BOOTH, L. A.  
Prospects of generating power with laser-driven  
fusion 13 p0002 A77-10634
- Heat transfer problems associated with laser fusion  
13 p0068 A77-18441



- Commercial application of laser fusion  
[LA-UR-76-1459] 14 p0227 N77-19872  
Technology assessment of laser-fusion power  
production  
[LA-UR-76-2060] 15 p0351 N77-22975
- BOOTE, S. H.  
Applications of cryogenic technology. Volume 8  
14 p0159 A77-22868
- BORDE, I.  
Performance of absorption cycle operating with low  
thermal-potential energy sources for  
direct-contact cooling applications  
16 p0450 A77-48756
- BORDINA, N. M.  
Use of radiation reflected from earth to increase  
the power of solar panels  
15 p0363 N77-24586
- BORETZ, J. R.  
Low cost dynamic energy conversion systems  
14 p0196 A77-28171  
Reactor hybrid-Organic Rankine Cycle Electric  
Power Systems /ORCEPS/ for space applications  
16 p0463 A77-48858
- BORG, I. Y.  
Oil, gas, uranium, and thorium: Supply and  
depletion, with special reference to California  
[UCRL-52180] 16 p0536 N77-31628
- BORGON, J.  
Influence of atmospheric conditions on the  
parameters of a turbojet engine  
15 p0323 A77-39270
- BORIES, S. A.  
Free thermal convection in geothermal fields -  
Physical understanding and mathematical modeling  
14 p0174 A77-24204
- BORIO, R. W.  
Laboratory analysis of solvent refined coal  
[PB-255550/6] 13 p0110 N77-12598
- BORISOV, D.  
The technical concept of the IL-62M. II - Fuel  
system  
14 p0156 A77-22120
- BORISOVA, N. A.  
Use of radiation reflected from earth to increase  
the power of solar panels  
15 p0363 N77-24586
- BORISOVA, S. M.  
Effect of nitrogenous bases on the thermal  
stability of jet fuels  
[NASA-TM-75131] 15 p0388 N77-27243
- BORODIN, L. P.  
Microwave radiometry of land and water areas on  
the earth surface from onboard aircraft  
laboratories  
16 p0433 A77-47201
- BORODINA, T. I.  
The second joint test of a U.S. electrode system  
in the U.S.S.R. U-02 facility  
15 p0327 A77-39540
- BORTNIKOV, I. S.  
Optimization of current source operation in pulse  
mode  
[IAF PAPER 76-255] 13 p0003 A77-10952
- BORTZ, B. J.  
Resource recovery technology for urban  
decision-makers  
[PB-252456/5] 13 p0093 N77-10964
- BORZONI, J. T.  
Design, fabrication, testing, and delivery of a  
solar energy collector system for residential  
heating and cooling  
[NASA-CR-150032] 13 p0086 N77-10638
- BOS, P.  
Proceedings of First Semiannual EPRI Solar Program  
Review Meeting and Workshop. Volume 1: Solar  
heating and cooling of buildings  
[PB-260594/7] 14 p0252 N77-21721  
Proceedings of First Semiannual EPRI Solar Program  
Review Meeting and Workshop. Volume 2: Solar  
electric power  
[PB-260595/4] 14 p0252 N77-21722
- BOS, R.  
Distribution of some hydrocarbons in ambient air  
near Delft and the influence on the formation of  
secondary air pollutants  
15 p0271 A77-32954
- BOSER, O.  
Safety considerations for high temperature thermal  
energy storage in fluoride salts  
16 p0451 A77-48768
- BOSTANDERIAN, S. A.  
Thermal explosion of moving reacting fluids of  
variable viscosity  
13 p0052 A77-14980
- BOSTIAN, H. B.  
Improved systems for energy conversion and  
conservation as pollution control alternatives -  
USEPA program  
16 p0451 A77-48771
- BOSTICK, P. X.  
Geothermal significance of magnetotelluric  
sounding in the eastern Snake River  
Plain-Yellowstone region  
15 p0310 A77-36999
- BOSTICK, W. H.  
Energy storage, compression, and switching  
15 p0299 A77-36284
- BOTAR, L.  
Mathematical method for determining reaction  
networks in chemical systems  
16 p0418 A77-43093
- BOTTS, W. V.  
Low-Btu gasification of coal by Atomics  
International's molten salt process  
13 p0023 A77-12687
- BOUAEZI, A.  
Increase of diffusion lengths of minority carriers  
under the effect of a width gradient of the  
forbidden band  
14 p0151 A77-21823
- BOUGHTON, E. M.  
In situ recovery of oil and minerals from Piceance  
Creek Basin oil shale  
13 p0023 A77-12694
- BOURGEOIS, S. V.  
Development status and environmental hazards of  
several candidate advanced energy systems  
16 p0452 A77-48776
- BOURGNET, J. M.  
Heat transportation by hot water pipe-lines at 90  
deg C  
[AD-A038301] 16 p0512 N77-28453
- BOURQUE, R.  
Design considerations for a noncircular Tokamak  
demonstration plant  
[GA-A-14074] 15 p0351 N77-22968
- BOUVIER, P.  
Details of hydrogen-burning thermonuclear reactions  
14 p0168 A77-23457
- BOUYSSON, G.  
Preliminary report on simulation of a heliostat  
field  
[ERDA-TR-158] 14 p0226 N77-19782
- BOWDEN, J. R.  
Prospects for coal as a direct fuel and its  
potential through application of liquefaction  
and gasification technology  
13 p0008 A77-11241
- BOWEN, D. W.  
Energy and the future  
14 p0246 N77-21657
- BOWEN, H. K.  
Test results on the spinel electrode module in  
laboratory and simulated MHD environment  
14 p0140 A77-21227  
Design and performance of high temperature ceramic  
electrode modules  
15 p0327 A77-39543
- BOWEN, J. S.  
Proceedings of the Stationary Source Combustion  
Symposium. Volume 1. Fundamental research  
[PB-256320/3] 13 p0116 N77-13569  
Proceedings of the Stationary Source Combustion  
Symposium. Volume 2. Fuels and process  
research and development  
[PB-256321/1] 13 p0116 N77-13570
- BOWEN, R.  
The production and refining of crude oil into  
military fuels  
[AD-A024652] 13 p0095 N77-11207
- BOWEN, R. G.  
Net energy delivery from geothermal resources  
14 p0178 A77-25137

- BOWERS, R. I.**  
Summary report: An exploratory study of cost targets for solar electric power plants [ORNL-TM-5787] 16 p0538 N77-31654
- BOWMAN, J. R.**  
United States Postal Service Electric Vehicle Program 14 p0161 A77-22912
- BOWMAN, M. G.**  
International cooperation on development of hydrogen technologies 14 p0171 A77-23717  
Progress in the Los Alamos Scientific Laboratory Program to develop thermochemical processes for hydrogen production 15 p0275 A77-33341  
Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353
- BOY-MARCOTTE, J.-L.**  
Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost 14 p0154 A77-21845
- BOYCE, D. E.**  
Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work. Analysis of the Philadelphia-Lindenwold high-speed line [PB-263048/1] 15 p0370 N77-25014
- BOYD, D. A.**  
A cylindrical blackbody solar energy receiver 13 p0018 A77-12404
- BOYD, J. E.**  
Evaluation of rail rapid transit and express bus service in the urban commuter market [PB-265236/0] 15 p0398 N77-28046
- BOYD, R. M.**  
Environmental impact studies related to underground coal gasification [TID-27003] 13 p0100 N77-11573
- BOYER, J. L.**  
Design considerations for heat recovery system for DD-963 class ship [ASME PAPER 77-GT-106] 14 p0197 A77-28616
- BOYLE, R. J.**  
Evaluation of initial collector field performance at the Langley Solar Building Test Facility [NASA-TM-X-73677] 15 p0378 N77-26617
- BOYNTON, W.**  
Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449
- BOZEK, J.**  
Baseline test data for the EVA electric vehicle 13 p0025 A77-12704
- BOZEK, J. M.**  
Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van [NASA-TM-X-73638] 14 p0236 N77-21549
- BRACELAND, B. V.**  
North American freight transportation - Near or incipient chaos 16 p0410 A77-41943
- BRADLEY, G. W.**  
Utility facilities in transportation corridors [PB-255635/5] 13 p0093 N77-10970
- BRADLEY, W. A.**  
Gaseous electrode development at BNC 15 p0325 A77-39530
- BRADLEY, T. G.**  
Development of compact lithium/iron disulfide electrochemical cells 13 p0026 A77-12715
- BRADLEY, W. G.**  
Environmental impact of major solar power development 16 p0452 A77-48773
- BRADLEY, W. J.**  
Peak power and heavy water production from electrolytic H<sub>2</sub> and O<sub>2</sub> using CANDU reactors 15 p0274 A77-33332
- BRAEGG, C.**  
Cost analysis of two air quality attainment strategies [PB-254182/9] 13 p0092 N77-10719
- BRAHIC, A.**  
Solar sails 15 p0267 A77-32215
- BRAHME, S. B.**  
Tidal power generation in India 15 p0310 A77-36988
- BRAINARD, J. P.**  
Energy situation in New England [BRL-50580] 15 p0381 N77-26650  
Briefing book on the energy situation in New England [BRL-21918] 16 p0515 N77-28599
- BRAINE, M. R.**  
Antenna design for offshore satellite links 16 p0442 A77-48493
- BRAHLETTE, T. T.**  
High temperature thermal energy storage 16 p0491 A77-49099  
Survey of high temperature thermal energy storage [SAND-75-8063] 13 p0088 N77-10655
- BRANCH, J. P.**  
Performance of gas-turbines and combined cycles operating on fuels produced by in-situ gasification of lignite 16 p0446 A77-48723
- BRANCH, M. C.**  
The formation of nitrogen oxides from fuel nitrogen [PB-252462/7] 13 p0092 N77-10717
- BRANDENBURG, M. J.**  
A parametric study of critical fuel costs for solar heating in North America 16 p0493 A77-49118  
Parametric study of critical fuel costs for solar heating in North America [CONF-760842-12] 15 p0392 N77-27533
- BRANDENBURG, M. W., JR.**  
Photovoltaic test and demonstration project 14 p0153 A77-21838  
Status of silicon solar cell technology 14 p0184 A77-26392  
Status of silicon solar cell technology [NASA-TM-X-73531] 13 p0106 N77-12519  
Analysis of epitaxial drift field on P silicon solar cells [NASA-TM-X-73563] 13 p0106 N77-12523  
Status of the ERDA/NASA photovoltaic tests and applications project [NASA-TM-X-73567] 13 p0114 N77-13537  
Improved backwall cell [NASA-CASE-LEW-12236-1] 14 p0211 N77-17565
- BRANDSTADTER, O.**  
Energy accumulation through stationary flywheel systems [BMFT-PB-T-76-58] 16 p0522 N77-29620
- BRANDSTADTER, A.**  
Generalized analysis of thermoelectric device configurations 14 p0177 A77-24572  
Solar cell array for concentrated sunlight 16 p0460 A77-48836
- BRANDSTADTER, W.**  
New developments on VW-PCI and VW-PCV stratified charge engine concepts 16 p0401 A77-41257
- BRANT, V. L.**  
Materials consideration for the Bigas coal gasification pilot plant [ASME PAPER 76-PVP-41] 15 p0323 A77-38825
- BRANTLEY, L. W.**  
Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking [NASA-CASE-HPS-23267-1] 14 p0228 N77-20401
- BRASLAVSKAIA, M. V.**  
Shortened focusing concentrators and focusing wedges 16 p0442 A77-48521
- BRAUBACH, B.**  
Trends in western Europe 15 p0308 A77-36808
- BRAUN, C.**  
Hydrogen for energy storage: A progress report of technical developments and possible applications [BRL-20931] 13 p0094 N77-11201  
Hydrogen storage, water electrolysis and fuel cells for electric energy storage [BRL-21498] 15 p0344 N77-22620
- BRAUN, D. J.**  
Potential for producing and marketing gasoline substitutes from western coal [BRL-2080 (BAP-4)] 15 p0340 N77-22291

- BRAUN, G. W.  
Integration of solar generation into electric utility systems  
[AIAA 77-1020] 16 p0404 A77-41562
- BRAUN, P.  
Application of solar heat to buildings in Austria 13 p0079 A77-19114
- BRAUN, R. L.  
Reactivity of oil shale carbonaceous residue with oxygen and carbon dioxide  
[UCRL-77829] 13 p0123 A77-14596
- BRAUNLICH, G.  
Solar heating projects at the Institute for Environmental Research 13 p0079 A77-19119
- BRAUNSTEIN, A.  
Performance analysis of a solar-electrical system with a load and storage batteries 14 p0177 A77-24570  
The influence of parameter dispersion of electrical cells on the array power output 16 p0420 A77-44264  
Array power output of non-identical electrical cells 16 p0468 A77-48903
- BRAY, G. R.  
Supply of liquefied natural gas to the Northeast [BNL-50556] 15 p0392 A77-27521
- BRECHER, L. E.  
Nuclear driven water decomposition plant for hydrogen production 13 p0035 A77-12791  
The Westinghouse Sulfur Cycle for the thermochemical decomposition of water 15 p0277 A77-33354  
Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle 15 p0277 A77-33356  
The Westinghouse sulfur cycle for the thermochemical decomposition of water 14 p0238 A77-21587  
Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle 14 p0238 A77-21589  
Hydrogen generation process [FE-2262-3] 16 p0533 A77-31337
- BRECHT, C.  
Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements 16 p0504 A77-51153
- BREITER, E. W.  
Recent progress in development of sodium-sulfur battery for utility application 16 p0448 A77-48740
- BREITSTEIN, L.  
MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems [ORNL-HUD-MIUS-6] 14 p0249 A77-21684
- BRENNAN, M.  
Energy storage and transfer with homopolar machine for a linear theta-pinch hybrid reactor [LA-6174] 14 p0214 A77-17892
- BRENNAN, P. J.  
Axially grooved heat pipes - 1976 [AIAA PAPER 77-747] 15 p0324 A77-39512  
Development of a low temperature phase change material package [AIAA PAPER 77-762] 15 p0325 A77-39514
- BRENNKECKE, P.  
Corrosion problems related to the employment of aluminum in collector construction 14 p0202 A77-29566  
Studies into reduction of radiative heat losses of flat plate solar collectors 16 p0417 A77-42962
- BRESLIN, J. A.  
Size distribution and mass output of particulates from diesel engine exhausts [TB-261416/2] 15 A77-22732
- BRENNAN, D. L.  
NASA Quiet Clean General Aviation Turbofan (QCGAT) program status [NASA-TN-X-73564] 15 p0353 A77-23109
- BREWER, G. D.  
Alternate fuels for future aircraft 16 p0444 A77-48709
- LH2 airport requirements study [NASA-CR-2700] 13 p0083 A77-10032
- BRIDENBAUGH, P. E.  
Photovoltaic properties and junction formation in CuInSe<sub>2</sub> 15 p0305 A77-36584
- BRIDGERS, P.  
Solar heating and cooling of a 25,500 square foot building 14 p0181 A77-26054
- BRIDGERS, P. E.  
Solar energy retrofit for existing buildings 14 p0168 A77-23444  
Experimental results for a heat pump system with thermal storage [COO-2704-3] 14 p0250 A77-21697
- BRIDGES, P. D.  
Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft [SAE PAPER 770470] 15 p0310 A77-37088
- BRISKE, T.  
Thermionic converter performance with oxide collectors 16 p0466 A77-48888
- BRISKE, T. E.  
Advanced thermionic converter development 13 p0043 A77-12862  
High efficiency thermionic converter studies [NASA-CR-135263] 16 p0546 A77-32592
- BRIGGS, W. B.  
Adapting the experience of DOD/Industry to developing fusion power reactors [AIAA 77-1019] 16 p0404 A77-41561
- BRILL, E. D., JR.  
Water and energy systems - A planning model 16 p0506 A77-51279  
Mathematical models for use in planning regional water resources and energy systems [PB-261364/4] 15 p0352 A77-23022
- BRINKWORTH, B. J.  
Solar energy 13 p0006 A77-11037  
Accelerated response of thermopile pyranometers 13 p0019 A77-12405  
Autocorrelation and stochastic modelling of insolation sequences 16 p0422 A77-44479
- BRISSET, J. J.  
Deposition of polycrystalline silicon solar cells 13 p0076 A77-19082
- BRITT, E. J.  
Thermionic topping for central station power plants 13 p0034 A77-12787  
Thermoelectronic laser energy conversion for power transmission in space 16 p0464 A77-48876  
Increased central station power plant efficiency with a thermionic topping system 16 p0467 A77-48894
- BRITTAIN, W. E.  
SNAP 19 Viking RTG mission performance 13 p0041 A77-12840
- BROBST, D. A.  
Mineral resources: Potentials and problems [USGS-CIRC-698] 16 p0544 A77-32563
- BROCKMAN, C. E.  
LANDSAT (ERTS) used as a basis for geological volcanological mapping in the central Andes [NASA-TN-75024] 15 p0390 A77-27474
- BROCKMAN, C. E.  
The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976 [E77-10028] 13 p0096 A77-11491
- BRODA, E.  
Solar energy utilization - The photochemical approach 13 p0075 A77-19076
- BRODIE, S. B.  
The assembly of large structures in space 16 p0524 A77-29770
- BRODY, T. P.  
Thin film solar cells for terrestrial applications [PB-255606/6] 13 p0109 A77-12553  
Thin film solar cells for terrestrial applications [PB-265983/7] 16 p0523 A77-29635

- BROGGI, A.**  
Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- OPTIMO - A method for process evaluation applied to the thermocchemical decomposition of water** 15 p0320 A77-38526
- BROWNEIN, H.**  
Future oil supply to the northeast United States [BNL-50557] 15 p0369 A77-24729
- BROWNEIL, G.**  
A new hydrogen storage electrode 13 p0047 A77-13539
- BROOKS, J.**  
Plasma heating systems planned for the Argonne experimental power reactor 16 p0407 A77-41712
- BROOKS, J. W.**  
Tokamak experimental power reactor [ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- BROOKS, P. W.**  
Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262
- BROOKS, R. D.**  
Coal fired combined cycle for electric power generation 16 p0453 A77-48783
- BROOKMAN, E. W.**  
Electric vehicle batteries - Opportunities for materials improvement 13 p0049 A77-13736  
An off-peak energy storage concept for electric utilities. I - Electric utility requirements 16 p0499 A77-49348
- BROSSEAU, J.**  
Microbial hydrogen production 15 p0278 A77-33367  
Microbial hydrogen production 14 p0239 A77-21601
- BROUNS, R. C.**  
KIPS - Kilowatt Isotope Power System 13 p0041 A77-12837
- BROWN, A.**  
Solar high technology and architecture 16 p0495 A77-49129
- BROWN, B. T.**  
ERDA/P&WA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology 16 p0446 A77-48721
- BROWN, C. D.**  
The environmental effects of using coal for generating electricity [PB-267237/6] 16 p0524 A77-29655
- BROWN, C. K.**  
Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario 16 p0489 A77-49085
- BROWN, C. T.**  
1 MWth solar cavity steam generator solar test program 16 p0461 A77-48846
- BROWN, D. G.**  
The pay-off for advanced technology in commercial aircraft design and operation 13 p0071 A77-19012
- BROWN, D. H.**  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles [NASA-CR-134949-VOL-2-PT-2] 15 p0379 A77-26633  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results [NASA-CR-134949-VOL-2-PT-4] 15 p0380 A77-26635  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment [NASA-CR-134949-VOL-3] 15 p0380 A77-26636
- BROWN, D. W.**  
Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing [LA-OR-76-1672] 14 p0221 A77-19597
- BROWN, G. V.**  
Magnetic heat pumping [NASA-CASE-LEW-12508-2] 16 p0543 A77-32435
- BROWN, E. L.**  
Thermodynamic analysis of an oil reclamation process [PB-268524/6] 16 p0548 A77-32614
- BROWN, K. T.**  
The dependence of current output of the Ti-TL SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on photostationary state composition 16 p0502 A77-50220
- BROWN, L. E.**  
Small scale tests on control methods for some liquefied natural gas hazards [AD-A033522] 15 p0341 A77-22293
- BROWN, W. J.**  
The formation of nitrogen oxides from fuel nitrogen [PB-252462/7] 13 p0092 A77-10717
- BROWN, R.**  
Ecological review of hydroelectric reservoirs in Puerto Rico [CYER-1] 16 p0540 A77-31673
- BROWN, R. A.**  
Development of nickel-zinc batteries for aircraft 14 p0195 A77-28148
- BROWN, T. D.**  
Coal-in-oil - A substitute boiler fuel [ASME PAPER 76-WA/FU-2] 14 p0185 A77-26453
- BROWN, W. C.**  
Microwave energy transmission [AIAA PAPER 77-540] 15 p0266 A77-32063  
Transmission of power from space to earth [AIAA 77-1026] 16 p0404 A77-41566
- BROWN, W. S.**  
Direct applications of geothermal energy 13 p0030 A77-12755
- BROWNELL, D. H., JR.**  
Geohydrological environmental effects of geothermal power production, phase 2A [PB-261687/8] 15 p0347 A77-22653  
Computer simulation of geothermal reservoirs [PB-265104/0] 15 p0395 A77-27564
- BROWNING, D. L.**  
Fabrication and assembly of large composite structures in space [AIAA PAPER 77-543] 15 p0266 A77-32065
- BROWNING, L. H.**  
Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine 16 p0444 A77-48706
- BROWNSTEIN, C. M.**  
Design of municipal services in support of high rise office buildings [PB-262532/5] 15 p0370 A77-25021
- BROWNING, G.**  
Layout and flight performance of a hypersonic transport /HST/ [DGLR PAPER 76-198] 13 p0060 A77-16575
- BRUNLVE, T. D.**  
Survey of high temperature thermal energy storage [SAND-75-8063] 13 p0088 A77-10655
- BRUNNER, S. B.**  
Rechargeability studies of ambient temperature lithium/sulfur batteries 16 p0447 A77-48729
- BRUNE, J. H.**  
Sandia studies for ERDA central receiver thermal electric power project 15 p0318 A77-38208
- BRUNE, W.**  
Critical comments concerning the application of the availability concept in power plant technology 15 p0265 A77-31850
- BRUNET, R.**  
Rural energy centre for Africa using solar, wind and biogas energies 16 p0496 A77-49139
- BRUNING, S. F.**  
The Shenandoah Community Center - A total solar design concept 13 p0047 A77-13506
- BRUNNER, P. A.**  
Eliminate source emission codes for coal-refuse fired power plants 16 p0504 A77-51128

## BRUNO, R.

- The Philips energy-experimentation house - Results and experience 15 p0336 A77-39982  
Calculation and optimization of solar-energy systems which provide hot water 15 p0337 A77-39988

## BRUNSOLD, A. R.

- Liquid-metal MHD - Cycle studies and generator experiments 13 p0034 A77-12785  
Liquid-metal MHD coupled to coal-fired fluidized-bed combustors 14 p0143 A77-21269

## BRUZZONE, R. A.

- A possible correlation of the neutron yield to the electrorechanic work in father-type plasma focus devices 13 p0061 A77-17017

## BRYAN, R. J.

- Study of gasoline vapor emission controls at small bulk plants [PB-267096/6] 16 p0549 N77-32638  
Reliability study of vapor recovery systems at service stations [PB-267613/8] 16 p0560 N77-33700

## BRZUSKIEWICZ, J.

- The weatherability of solar energy utilization materials - Preliminary discussions 16 p0487 A77-49070  
Weatherability of solar energy utilization materials: Preliminary discussions [CONF-76C821-11] 14 p0225 N77-19650

## BUBE, R. R.

- Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023  
Photovoltaic properties of five II-VI heterojunctions 14 p0205 A77-29892  
Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741  
Analysis of the fill factor for n-CdS/p-CdTe solar cells 16 p0402 A77-41433  
Applied research on II-VI compound [PB-254637/2] 13 p0098 N77-11547

## BUCH, A.

- Geothermal sources and their utilization 13 p0055 A77-15803

## BUCH, P.

- Photovoltaic properties of five II-VI heterojunctions 14 p0205 A77-29892  
Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741  
Applied research on II-VI compound [PB-254637/2] 13 p0098 N77-11547  
Photovoltaic II-VI compound heterojunctions for solar energy conversion [PB-259195/6] 14 p0251 N77-21702

## BUCHBERG, B.

- Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions [ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508  
Transparent glass honeycomb structures for energy loss control [SAB/1084-75/1] 14 p0248 N77-21673

## BUCHBOLZ, R. L.

- Conceptual design of a parabolic dish solar collector using simulation techniques 15 p0318 A77-38211

## BUCKINGHAM, J. R.

- An optimization study of a low thermal potential power system [AD-A031709] 15 p0348 N77-22666

## BUCKLAND, R. E.

- A proposed method of rating the thermal performance of solar collectors 16 p0473 A77-48946

## BUCKLEY, B. S.

- An economic analysis of thermic diode solar panels [ASME PAPER 76-WA/SOL-7] 14 p0188 A77-26512

## BUCKLEY, S.

- Thermic diode solar panels - A brief summary 16 p0472 A77-48936

## BUDENHOLZER, R. A.

- Putting alternative sources of energy into perspective 16 p0414 A77-42633

## BUDER, H. K.

- Factors influencing the economics of large-scale in situ coal gasification operations 15 p0306 A77-36765

## BUDGE, T.

- Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico [E77-10090] 14 p0214 N77-18511

## BUDGEN, H. P.

- Rural energy centre for Africa using solar, wind and biogas energies 16 p0496 A77-49139

## BUDZYNSKI, K.-H.

- Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility 15 p0271 A77-32800

## BUHLER, E.

- Preparation of CdS/InP solar cells by chemical vapor deposition of CdS 14 p0205 A77-29893  
InP-CdS solar cells 15 p0259 A77-30740

## BUGLER, J. W.

- The determination of hourly insolation on an inclined plane using a diffuse irradiance model based on hourly measured global horizontal insolation 16 p0501 A77-50206

## BUHRMAN, R. A.

- Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films 16 p0502 A77-50281

## BUHS, R.

- Status report on the German experimental study for terrestrial solar electric generators 14 p0153 A77-21836

## BUICK, T. R.

- On the energy pattern factor in wind measurements 15 p0322 A77-38788

## BULLARD, C. W.

- Energy analysis handbook. CAC document 214 [COO-2865-1] 15 p0372 N77-25635

## BUNARSKOV, A. O.

- Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator 14 p0136 A77-20109  
Investigating the starting modes of the GT-35 gas turbine plant 16 p0426 A77-45324

## BUNBY, J.

- Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator 14 p0144 A77-21386

## BUNGER, J. W.

- Characterization of a Utah tar sand bitumen 14 p0170 A77-23561  
Recovery of bitumen from oil-impregnated sandstone deposits of Utah 14 p0194 A77-27349

## BUNKER, W. W.

- ERDA's gas turbine development program for the next decade 13 p0011 A77-11324

## BUNTZEN, R. B.

- Development scenario for laser fusion [UCRL-76980] 14 p0216 N77-18575

## BUONICORE, A. J.

- Energy and the environment; Proceedings of the Third National Conference, Oxford, Ohio, September 29-October 1, 1975 15 p0291 A77-35146

- District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164

## BURAKHANOV, B. B.

- Investigation of two-dimensional electric effects in a sectional MHD-channel 15 p0317 A77-37930

## BURCH, D. E.

- A multigas analyzer for automobile exhausts 15 p0297 A77-36026

- BURCH, D. P.  
Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643
- BURCHILL, B. F.  
Underground coal mine instrumentation and test  
[NASA-CR-150045] 16 p0551 N77-33479
- BURDAKOV, V. P.  
Extraterrestrial resources and astronautics  
16 p0499 A77-49400
- BURENIN, I. A.  
Investigation of a coaxial explosion-type MHD  
generator  
15 p0268 A77-32313
- BURENKOV, D. K.  
Study of the electrical characteristics of the  
boundary layer on the metal surfaces in the  
channels of an open cycle MHD generator  
13 p0054 A77-15666  
Joint test of an U.S. electrode system in the  
U.S.S.R. U-02 facility  
14 p0139 A77-21215  
Study of the maximum Hall voltages and  
interelectrode breakdown in the channel of an  
open-cycle MHD generator - A joint U.S.-U.S.S.R.  
experiment on the U02 facility MHD generator  
15 p0329 A77-39554
- BURGER, T. M.  
RANM utilization experience (case studies 32  
through 41)  
[PB-263683/5] 15 p0370 N77-25027
- BURGESS, E. L.  
Photovoltaic energy conversion using concentrated  
sunlight  
14 p0203 A77-29579  
Performance of n+/p silicon solar cells in  
concentrated sunlight  
15 p0258 A77-30729  
Photovoltaic energy conversion using concentrated  
sunlight  
16 p0402 A77-41516  
Photovoltaic energy conversion using concentrated  
sunlight  
[SAND-76-5759] 14 p0225 N77-19647  
Silicon solar cell development for  
concentrated-sunlight, high-temperature  
applications  
[SAND-76-5311] 15 p0380 N77-26647  
Silicon solar cell testing in concentrated  
sunlight and simulated sunlight  
16 p0527 N77-30540
- BURIAK, A. A.  
Principal stages in the development of  
thermoelectric power in the USSR  
14 p0156 A77-22123
- BURKE, J. D.  
Where do we locate the moon base  
16 p0504 A77-51023
- BURKE, R.  
Systems analysis of accelerator and storage ring  
systems for inertial fusion  
15 p0334 A77-39744
- BURKHARDT, L. C.  
The magnetic energy storage system used in ZT-1  
15 p0299 A77-36314
- BURNHAM, J. B.  
Recommendations for a US geothermal research plan,  
volume 1  
[PB-261566/4] 15 p0346 N77-22640  
Recommendations for a US geothermal research plan.  
Volume 1: Appendix A: Glossary. Appendix B:  
Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641  
Recommendations for a US geothermal research plan.  
Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642  
Recommendations for a geothermal utilization plan,  
Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- BURNHAM, K. B.  
The manufacture of hydrogen from coal  
15 p0275 A77-33337  
The IGT low-Btu gas process - Design and economics  
15 p0301 A77-36335  
The manufacture of hydrogen from coal  
14 p0237 N77-21566
- BURNS, R. H.  
Unit commitment in large power systems: Economic  
priorities of steam units and applications of  
pumped-storage generation  
16 p0545 N77-32588
- BURNS, W. W., III  
A theory of control for a class of electronic  
power processing systems: Energy-storage  
dc-to-dc converters  
[NASA-CR-152696] 15 p0344 N77-22614
- BURRABATO, G.  
Thin film solar acceptors  
13 p0072 A77-19053
- BURSHALL, W. J.  
Space shuttle missions of the 80's; Proceedings of  
the Twenty-first Annual Meeting, Denver, Colo.,  
August 26-28, 1975. Parts 1 & 2  
15 p0304 A77-36526
- BURTON, L.  
CdS/Cu2S solar cells - A low-cost thin film  
polycrystalline photovoltaic device for  
terrestrial applications  
16 p0486 A77-49059
- BURTON, L. C.  
CdS-Cu2S solar cells fabricated on Cd2SnO4-silica  
substrates  
13 p0007 A77-11110  
Cadmium stannate selective optical films for solar  
energy applications  
[PB-254879/0] 13 p0090 N77-10678  
Cadmium stannate selective optical films for solar  
energy applications  
[PB-261850/2] 15 p0348 N77-22672
- BURTON, R. S.  
Development of the modified in situ oil-shale  
process  
14 p0193 A77-27342
- BURTZ, R. D.  
Alternate fuel capability of Rankine cycle engines  
13 p0036 A77-12801
- BUSCH, R. A.  
Physical properties of western coal waste materials  
[PB-266724/4] 16 p0530 N77-30657
- BUSCHING, R. W.  
Conference report: Energy Conservation in  
Transportation and Construction  
[PB-255857/5] 13 p0100 N77-11562
- BUSH, G. E.  
Simple home heating system (what can be done now)  
[UCRL-77875] 14 p0232 N77-20598
- BUSH, H. I.  
Potential improvements in engine performance using  
a variable geometry turbine  
15 p0340 N77-22141
- BUSH, J. B., JR.  
Compressed air energy storage - A near term option  
for utility application  
13 p0027 A77-12727
- BUSH, M. A.  
Detecting structural heat losses with mobile  
infrared thermography. Part 4: Estimating  
quantitative heat loss at Dartmouth College,  
Hanover, New Hampshire  
[AD-A031803] 14 p0228 N77-20393
- BUSH, T. W.  
Basic studies of coal pyrolysis and  
hydrogasification  
[PB-254878/2] 13 p0096 N77-11511
- BUSHNELL, D. M.  
An overview of concepts for aircraft drag reductions  
16 p0543 N77-32092
- BUSI, J. D.  
Electric vehicle research, development and  
technology - foreign  
[AD-A036458] 16 p0512 N77-28419  
Electric vehicle research, development, and  
technology, foreign  
[AD-A040526] 16 p0542 N77-32034
- BUTLER, B. L.  
The application of laminated wooden blades to a  
two-meter Darrieus type vertical axis wind turbine  
14 p0156 A77-22142  
Application of laminated wooden blades to a  
two-meter Darrieus type vertical axis wind turbine  
[SAND-75-0284] 16 p0521 N77-29612
- BUTLER, J. P.  
Peak power and heavy water production from  
electrolytic H2 and O2 using CANDU reactors  
15 p0274 A77-33332

- BUTLER, H. A.  
Photoelectrolysis with YFeO<sub>3</sub> electrodes  
16 p0399 A77-40553
- BUTZE, H. F.  
Effect of ceramic coating of JT8D combustor liner  
on maximum liner temperatures and other  
combustor performance parameters  
[NASA-TM-X-73581] 13 p0126 N77-15037
- BUZEK, B.  
Fundamental studies of black chrome for solar  
collector use  
16 p0498 A77-49160
- BYRD, J., JR.  
The use of an interactive energy model for  
technology assessment with special reference to  
underground coal gasification  
[PB-255543/1] 13 p0098 N77-11545
- BYSTROV, P. I.  
Study of the properties of heat pipes with  
liquid-metal heat-transfer agents in  
low-temperature regimes  
13 p0046 A77-13243
- BYWATERS, B.  
Energy management for Texas commerce and industry  
[PB-268409/0] 16 p0548 N77-32616

## C

- CABAL, A. V.  
Upgrading coal liquids to gas turbine fuels. II -  
Compatibility of coal liquids with petroleum fuels  
14 p0177 A77-24852
- CABELLI, A.  
Storage tanks - A numerical experiment  
14 p0180 A77-25898
- CADOFF, L. H.  
The evaluation of electrode materials for slag  
coated MHD channels  
15 p0328 A77-39545
- CAESAR, P.  
Investment planning in the energy sector  
[LBL-4474] 13 p0125 N77-14948
- CAHEN, D.  
Photoelectrochemical energy conversion and storage  
- The polycrystalline CdSe cell with different  
storage modes  
14 p0196 A77-28463
- CAHILL, E. J.  
North Slope oil and United States energy supply  
15 p0309 A77-36823
- CAHN, R. P.  
Storage in oil of off-peak thermal energy from  
large power stations  
13 p0027 A77-12730
- CAIN, W. C.  
Development status and environmental hazards of  
several candidate advanced energy systems  
16 p0452 A77-48776  
Environmental considerations in advanced energy  
conversion technology assessments  
16 p0452 A77-48777
- CAIOLA, N. J.  
Long term performance prediction of residential  
solar energy heating systems  
13 p0039 A77-12822
- CAIRELLI, J. E.  
Ceramic applications in the advanced Stirling  
automotive engine  
[NASA-TM-X-73632] 15 p0354 N77-23487
- CALAFELL, D. O., II  
Determination of average ground reflectivity for  
solar collectors  
14 p0181 A77-25903  
Determination of average ground reflectivity for  
solar collectors  
16 p0471 A77-48933
- CALEP, C. E.  
Energetics of the United States of America: An  
atlas  
[BNL-50501] 16 p0522 N77-29615
- CALIFANO, F. P.  
Photovoltaic effect applications  
13 p0075 A77-19080
- CALL, D. L.  
Development of nickel-zinc batteries for aircraft  
14 p0195 A77-28148
- CALLAHAN, H. A.  
Hydrocarbon fuel conditioner for a 1.5 kW fuel  
cell power plant  
14 p0195 A77-28168
- CALLLEN, R. B.  
Upgrading coal liquids to gas turbine fuels. I -  
Analytical characterization of coal liquids  
14 p0145 A77-21623  
Upgrading coal liquids to gas turbine fuels. III -  
Exploratory process studies  
14 p0178 A77-24853
- CALLISTER, W. D., JR.  
Corrosion of potential MHD preheater materials in  
liquid slag and slag-seed  
15 p0327 A77-39541
- CALUORI, V. A.  
Photovoltaic solar power satellites  
16 p0463 A77-48866
- CALVIN, M.  
Photosynthesis as a resource for energy and  
materials  
13 p0017 A77-12233
- CANDEN, J. T.  
Automotive engines - A viable alternative for  
aircraft  
[SAE PAPER 770466] 15 p0310 A77-37084
- CAMPANA, D.  
The use of solar cells as energy supply for a  
pumping system  
14 p0155 A77-21854
- CAMPBELL, B. C.  
Development of a low capital cost electrolyzer  
15 p0277 A77-33362  
Development of a low capital cost electrolyzer  
14 p0239 N77-21596
- CANG, T. Y. P.  
Vibration characteristics of a large wind turbine  
tower on non-rigid foundations  
[NASA-TM-X-73670] 15 p0378 N77-26613
- CANJA, S. S.  
Assuring the performance of fossil energy programs  
16 p0503 A77-50499
- CANNAVIELLO, M.  
Wetting and surface properties of refrigerants to  
be used in heat pipes  
13 p0119 N77-14386
- CANNON, W. E.  
Design and performance of high temperature ceramic  
electrode modules  
15 p0327 A77-39543
- CANTAFIO, L. J.  
Photovoltaic, gravitationally-stabilized  
solid-state, satellite solar power station  
/GSS4PS/  
[AIAA PAPER 77-511] 14 p0173 A77-23927  
The evolution of the photovoltaic, gravitationally  
stabilized, solid-state satellite solar power  
station  
16 p0464 A77-48874
- CAPPS, W.  
Some properties of coal slags of importance to MHD  
15 p0330 A77-39563
- CAPUTO, R.  
Comparative assessment of orbital and terrestrial  
central power plants  
16 p0465 A77-48878  
An initial comparative assessment of orbital and  
terrestrial central power systems  
[NASA-CR-152688] 15 p0343 N77-22612  
An initial comparative assessment of orbital and  
terrestrial central power systems  
[NASA-CR-155042] 16 p0546 N77-32594
- CAPUTO, R. S.  
Solar thermal electric power plants - Their  
performance characteristics and total social costs  
13 p0037 A77-12804
- CARASSO, M.  
The Energy Supply Planning Model - A working tool  
for regional analysis of alternative national  
energy policies  
15 p0319 A77-38221
- CARATSCH, M.  
Heating with solar energy  
16 p0506 A77-51370
- CARBAJAL, B. G.  
Automated array assembly task, phase 1  
[NASA-CR-153909] 15 p0391 N77-27505

- CARD, W. B.  
Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps [ASME PAPER 76-WA/SOL-23] 14 p0190 A77-26528  
Commercial building unitary heat pump system with solar heating [PB-255488/9] 13 p0099 A77-11551
- CARDEN, P. O.  
Energy corrosion using the reversible ammonia reaction 16 p0422 A77-44483
- CARESSA, J. P.  
Non equilibrium ionization in a linear magnetohydrodynamic generator, using a high pressure supersonic argon flow 15 p0309 A77-36817
- CARLOW, H. R.  
Infrared extinction spectra of some common liquid aerosols 15 p0290 A77-34561
- CARLSON, D. E.  
Amorphous silicon solar cells 15 p0259 A77-30733
- CARLSON, W.  
Thermal barrier coating on high temperature industrial gas turbine engines [NASA-CR-135147] 15 p0390 A77-27496
- CARLSON, R. A.  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization [CONF-760222-P4] 14 p0248 A77-21675
- CARLSON, R. R.  
Effect of automotive parts on vehicle and engine emissions. Phase 1: Original equipment [PB-264057/1] 15 p0368 A77-24672
- CARMICHAEL, A. D.  
Environmental assessment of advanced energy conversion technologies 16 p0452 A77-48778
- CARMICHAEL, D. C.  
Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays [NASA-CR-149451] 13 p0106 A77-12524
- CARNASCIALI, G.  
Increased central station power plant efficiency with a thermionic topping system 16 p0467 A77-48894
- CARNEGIE, E. J.  
Design and performance of an air collector for industrial crop dehydration 16 p0488 A77-49078
- CARNEY, J.  
Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743
- CARNEY, J. K.  
New analysis of a high-voltage vertical multijunction solar cell 13 p0069 A77-18490
- CARPENTER, E. C.  
Fracturing oil shale for in situ retorting experiments 14 p0193 A77-27341
- CARPENTER, R. T.  
The low cost high performance generator /LCHPG/ 13 p0042 A77-12855
- CARPETIS, C.  
A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 15 p0279 A77-33378  
On the storage of hydrogen by use of cryo-adsorbents 15 p0283 A77-33408  
A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car 14 p0240 A77-21612  
On the storage of hydrogen by use of cryo-adsorbents 14 p0245 A77-21646
- CARR, H. S.  
Near-term advanced electric vehicle batteries 14 p0161 A77-22909
- CARR, R. B.  
Energy and technology review [UCID-52000-76-2] 13 p0131 A77-15508
- CARROLL, D. P.  
The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface 16 p0414 A77-42634  
The interaction of batteries and fuel cells with electrical distribution systems - Force commutated converter interface 16 p0414 A77-42635
- CARROLL, S. L.  
Methanol from coal fuel and other applications [ORAU-126] 13 p0094 A77-11200
- CARROLL, T. O.  
Regional land use and energy modeling [BNL-21809] 15 p0378 A77-26595
- CARROLL, W. F.  
Consideration of encapsulants for photovoltaic arrays in terrestrial applications 14 p0203 A77-29580
- CARRUBBA, R.  
Durability testing at one atmosphere of advanced catalysts and catalyst supports for automotive gas turbine engine combustors, part 1 [NASA-CR-135132] 16 p0520 A77-29519
- CARSON, J. E.  
Atmospheric impacts of evaporative cooling systems [ANL-ES-53] 15 p0367 A77-24643
- CARTER, L. F.  
Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems [PB-253097/0] 13 p0099 A77-11556
- CARTER, W. O.  
The design of a solar cooling and heating system for a commercial building 16 p0497 A77-49148
- CARTER, W. S.  
Use of getters in evacuated solar collectors 16 p0487 A77-49069
- CARTY, R.  
A thermochemical data bank for cycle analysis 15 p0276 A77-33346
- CARTY, R. H.  
Stage efficiency in the analysis of thermochemical water decomposition processes 13 p0047 A77-13538  
Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374  
A thermochemical data bank for cycle analysis 14 p0238 A77-21578  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 14 p0240 A77-21608
- CARUSO, P. S., JR.  
Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASME PAPER 76-WA/HT-10] 14 p0186 A77-26470
- CASE, C. W.  
Methods for geothermal reservoir detection emphasizing submerged environments [LBL-4495] 14 p0236 A77-21532
- CASELLA, A. J.  
Solar economics in Illinois 16 p0497 A77-49152
- CASS-BEGGS, D.  
The energy situation in Canada 14 p0165 A77-23307
- CASSEL, T. A. V.  
Effect of reservoir temperature decline on geothermal power plant design and economics 16 p0456 A77-48805  
Energy Conservation Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach [NASA-CR-134949-VOL-2-P1-1] 15 p0319 A77-26632
- CASSIDY, J. F.  
Emissions and total energy consumption of a multicylinder piston engine running on gasoline and a hydrogen-gasoline mixture [NASA-TN-D-8487] 15 p0353 A77-23114
- CASTAGNE, B.  
Energy conservation in the investment policies of French firms. I - Formulation of the problem 15 p0324 A77-39504



- CASTIEL, A.  
The use of solar cells as energy supply for a  
pumping system 14 p0155 A77-21854
- CASTILLO, R.  
Advanced fuel nuclear reaction feasibility using  
laser compression. II 16 p0435 A77-47359
- CATO, D.  
International energy demand model - Twenty OECD  
country models 15 p0318 A77-38215
- CAVARD, D.  
Cost aspects of solar energy - Selective and  
critical bibliography 13 p0054 A77-15799
- CENKNER, A. A., JR.  
Extended cryogenic performance of Lobar Wick heat  
pipe/radiator 13 p0119 N77-14379
- CERINI, D. J.  
Onboard hydrogen generation for automobiles 13 p0020 A77-12663  
A two-phase rotary separator demonstration system  
for geothermal energy conversion 16 p0456 A77-48807  
Hydrogen-rich gas generator  
[NASA-CASE-NPO-13560-1] 13 p0086 N77-10636
- CERRUTI, D.  
Dual Phase Annual Cycle for residential heating  
and cooling 16 p0497 A77-49149
- CERVI, M. C.  
Aluminum-based anodes for underwater fuel cells:  
A phase report  
[AD-A026405] 13 p0131 N77-15512
- CERVIK, J.  
Degasification and production of natural gas from  
an airshaft in the Pittsburgh coalbed  
[PB-258101/5] 14 p0210 N77-17555
- CEYNOWA, J.  
Simplex optimization of carbon electrodes for the  
hydrogen oxygen membrane fuel cell 16 p0500 A77-50200
- CHA, C. Y.  
Development of the modified in situ oil-shale  
process 14 p0193 A77-27342
- CHABOSEAU, J.  
Description, output and development prospects of a  
750 C helium direct cycle nuclear power plant  
with a single turbomachine and intermediate  
cooling [ASME PAPER 77-GT-2] 14 p0197 A77-28522
- CHAI, Y. G.  
Semiconductor-electrolyte photovoltaic cells  
employing CdSe and CdTe 15 p0259 A77-30742
- CHAIT, I. L.  
Energy conservation with advanced power generating  
systems 13 p0026 A77-12723
- CHAJES, A.  
Investigation of the feasibility of using  
windpower for space heating in colder climates.  
The final design and manufacturing phase of the  
project [BRDA/NSF-00603/75/T1] 14 p0215 N77-18561
- CHAKEDIS, D. V.  
LLL-Sohio solar process heat project. Report no.  
3: LLL solar energy group [UCID-16630-3] 13 p0123 N77-14604
- CHAKRAVARTY, S. P.  
Possible pollution and cost analysis from wide use  
of hydrogen fuel in transportation 15 p0285 A77-33422  
Possible pollution and cost analysis from wide use  
of hydrogen fuel in transportation 14 p0247 N77-21664
- CHAMBADAL, P.  
The gas turbine 14 p0162 A77-22921
- CHAMBERLAIN, R. M.  
Advanced coal gasification system for electric  
power generation [FE-1514-176] 13 p0088 N77-10653
- CHAMBERLAIN, T. W.  
Methanol as automotive fuel. Part 1: Straight  
methanol [CONF-750264-1] 15 p0389 N77-27246
- CHAMBERLIN, J. B.  
Analysis of electrical power generation costs 15 p0257 A77-30600
- CHAMBERS, R. F., JR.  
Dilute-phase hydrogasification process for SNG  
production 14 p0191 A77-27277
- CHAN, P.  
Analysis of the California energy industry  
[LBL-5928] 16 p0557 N77-33640
- CHANDRA, A.  
Conductivity of seeded combustion products of  
acetylene systems 15 p0288 A77-34039
- CHANG, G.  
Flywheel module for electric vehicle regenerative  
braking 16 p0447 A77-48728
- CHANG, G. C.  
Compressed air energy storage - A near term option  
for utility application 13 p0027 A77-12727  
An assessment of mechanical energy storage for  
solar systems 16 p0460 A77-48839
- CHANG, J.  
Methanol engine: A transportation strategy for  
the post-petroleum era [UCRL-52041] 14 p0219 N77-19469
- CHANG, K. C.  
Spectral response and efficiency relations in  
semiconductor liquid junction solar cells 15 p0264 A77-31823  
Stable semiconductor liquid junction cell with 9  
percent solar-to-electrical conversion efficiency 15 p0290 A77-34429  
Solar conversion efficiency of pressure sintered  
cadmium selenide liquid junction cells 15 p0320 A77-38367
- CHANG, M.  
Durability testing at one atmosphere of advanced  
catalysts and catalyst supports for automotive  
gas turbine engine combustors, part 1 [NASA-CR-135132] 16 p0520 N77-29519
- CHANNON, S.  
The magma high energy advanced fuel direct  
conversion fusion power plant 13 p0035 A77-12794
- CHANNON, S. R.  
Design considerations for a magma advanced fuel  
fusion reactor 15 p0334 A77-39747  
Methods of 'tailoring' ion distributions in phase  
space /'morphodynamics'/ 16 p0436 A77-47364
- CHANTELL, B.  
The long term stability of magnetic liquids for  
energy conversion devices 14 p0177 A77-24573
- CHAO, K. C.  
Vapor-liquid equilibrium of hydrogen/tetralin  
system at elevated temperatures and pressures 16 p0412 A77-42406
- CHAPIN, D. L.  
Optimization of fusion-driven fissioning systems  
[PPPL-1285] 15 p0342 N77-22469
- CHAPMAN, D.  
User's guide to petroleum industry survey data type  
[PB-256635/4] 13 p0098 N77-11544
- CHAPMAN, D. S.  
The flow of heat from the earth's interior 16 p0408 A77-41800
- CHAPMAN, P.  
Power supplies for full time fly-by-wire aircraft  
control systems 15 p0320 A77-38461  
Aircraft power supplies and cooling problems: A  
viewpoint from the power conditioner designer 14 p0207 N77-16039
- CHAPMAN, P. F.  
Principles of energy analysis 13 p0007 A77-11045  
Methods of energy analysis 13 p0007 A77-11046

- CHARKEY, A.  
Advances in component technology for nickel-zinc cells  
13 p0025 A77-12710
- CHARLES, R.  
Geothermal chemistry activities at LASL  
[LA-6448-PR] 15 p0344 A77-22623
- CHARLES, S. W.  
The long term stability of magnetic liquids for energy conversion devices  
14 p0177 A77-24573
- CHARLSON, E. J.  
Development of a new silicon Schottky photovoltaic energy converter  
[PB-262491/4] 15 p0373 A77-25654  
Temperature dependence of the photovoltaic performance of Si cells under blue, white, and near-bandgap irradiation  
[UCRL-76203] 15 p0381 A77-26652
- CHARBOPPIN, P.  
Some thoughts on optimizing long-distance heat transport systems and their storage facilities  
[AD-A038253] 16 p0516 A77-28608
- CHARTERS, W. W. S.  
Natural convection phenomena in inclined cells with finite side-walls - A numerical solution  
16 p0500 A77-50201
- CHASE, V. D.  
New hydrogen process is in the works  
14 p0205 A77-29789
- CHATTERJEE, J. S.  
An alternative fuel for cars  
13 p0050 A77-14530
- CHATTERJI, D.  
Recent progress in development of sodium-sulfur battery for utility application  
16 p0448 A77-48740  
Development of sodium-sulfur batteries for utility application  
[EPRI-EM-266] 15 p0391 A77-27510
- CHAUHAN, R. S.  
Solar energy concentration with liquid lenses  
14 p0158 A77-22649
- CHAULIAGUET, C.  
Solar energy in the building  
15 p0303 A77-36411
- CHEEK, R. M.  
600 kW Organic Rankine Cycle Waste Heat Power Conversion System  
16 p0459 A77-48829
- CHEEMA, L. S.  
Temperature optimization for power production of infinite heat transfer solar absorbers  
13 p0073 A77-19055
- CHEEN, C. S.  
The ERDA automotive gas turbine program  
16 p0443 A77-48703
- CHEEN, R.  
Simple thermal decomposition reactions for storage of solar thermal energy  
15 p0292 A77-35153
- CHEEN, J. C.  
Analysis of power cycles with centrifugal fluidized bed coal combustion  
16 p0453 A77-48787
- CHEEN, K.  
Energy R&D modeling for budgetary decisions  
15 p0319 A77-38218
- CHEEN, T.-P.  
Mathematical modelling of coal combustion in fluidized beds with sulphur emission control by limestone or dolomite  
16 p0508 A77-51587
- CHEEN, W.  
Design considerations for a noncircular Tokamak demonstration plant  
[GA-A-14074] 15 p0351 A77-22968
- CHEEN, W. Y.  
Superconducting induction coil for a doublet Tokamak experimental fusion power reactor  
14 p0144 A77-21376
- CHENEY, M. C.  
Self-regulating composite bearingless wind turbine  
16 p0491 A77-49095
- CHEUNG, P.  
Numerical solutions for steady free convection in island geothermal reservoirs  
14 p0174 A77-24205
- Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir  
[PB-261562/3] 14 p0252 A77-21726
- Similarity solutions for mixed convection from horizontal impermeable surfaces in saturated porous media  
[PB-261561/5] 15 p0342 A77-22432
- The influence of lateral mass efflux on free convection boundary layers in a saturated porous medium  
[PB-261558/1] 15 p0342 A77-22587
- CHEHENISINOFF, P. M.  
Energy from solid wastes  
13 p0003 A77-10698  
Energy from wood wastes  
15 p0273 A77-33301
- CHEERISH, P.  
Operation of the Westinghouse Coal Gasification Process Development Unit  
13 p0023 A77-12689
- CHEERKAS, V. D.  
Study of the ionization of the additive in MHD installations  
13 p0002 A77-10424
- CHEERN, J. M.  
Design and performance of an air collector for industrial crop dehydration  
16 p0488 A77-49078
- CHEERNOFF, R. C.  
Phase conjugation method and apparatus for an active retrodirective antenna array  
[NASA-CASE-NPO-13641-1] 15 p0360 A77-24340
- CHEERNORDIK, L. I.  
Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator  
14 p0136 A77-20109  
Investigating the starting modes of the GT-35 gas turbine plant  
16 p0426 A77-45324
- CHEERITT, A. W.  
A 100-kW metal wind turbine blade basic data, loads and stress analysis  
[NASA-CR-134956] 14 p0236 A77-21467
- CHEERY, W. R.  
ERDA/USDA Agricultural Solar Thermal Energy Program  
16 p0470 A77-48921  
ERDA Solar Thermal Energy Program for industrial process heat  
16 p0470 A77-48922  
Proceedings of the Solar Industrial Process Heat Workshop  
[CONF-760655] 15 p0373 A77-25643
- CHEUNG, A.  
Energy from humid air  
[AIAA PAPER 77-730] 15 p0311 A77-37253
- CHEVY, A.  
Photovoltaic properties of GaSe and InSe junctions  
15 p0289 A77-34117
- CHI, C.-T.  
A method for evaluating SO2 abatement strategies  
15 p0293 A77-35169
- CHI, S. W.  
Heat pipe theory and practice  
13 p0052 A77-14825
- CHIAO, T. T.  
Composite fiber flywheel for energy storage  
15 p0306 A77-36672  
Composite fiber flywheel for energy storage  
[UCRL-78085] 14 p0225 A77-19645  
Fiber composite program for flywheel applications  
[UCRL-50033-76-1] 15 p0345 A77-22633
- CHICKERING, J. B.  
A basis for analyzing prospective power generation in terms of environmental management and energy use  
13 p0096 A77-11526
- CHIKOVANI, V. V.  
Combined cycles in single circuit solar refrigerating systems  
15 p0286 A77-33434  
Conjugate cycles of single-loop solar power and refrigeration plants  
16 p0427 A77-45547
- CHILENSKAS, A. A.  
Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion  
14 p0161 A77-22910

- The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery  
16 p0446 A77-48726
- Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles [CONF-760617-3]  
16 p0535 N77-31618
- CHING, B. K.  
Space power systems - What environmental impact  
14 p0146 A77-21757
- CHIOU, J. P.  
On the study of applications of solar thermal energy for mobile homes  
16 p0501 A77-50204
- CHIQUET, A.  
Small gas turbines and the Total Energy concept  
14 p0156 A77-22024
- CHRISTOPANOVA, H. V.  
Investigation of the flow and the temperature distribution in the vapor duct of a high-temperature heat pipe  
15 p0306 A77-36708
- CHITRE, S.  
Development of low cost, high energy-per-unit-area solar cell modules [NASA-CN-153977]  
16 p0528 N77-30605
- CHO, S. H.  
Coal gasification combined-cycle pilot plant system analysis  
16 p0446 A77-48724
- CHOBOTOV, V.  
The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station  
16 p0464 A77-48874
- CHOBOTOV, V. A.  
Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station /GSS4PS/ [AIAA PAPER 77-511]  
14 p0173 A77-23927
- Gravitationally stabilized satellite solar power station in orbit  
14 p0196 A77-28421
- CHOCK, D. P.  
General Motors Sulfate Dispersion Experiment - Assessment of the EPA HIWAY model  
13 p0671 A77-18882
- CHOCK, E. P.  
Generalized analysis of thermoelectric device configurations  
14 p0177 A77-24572
- CHOI, C.  
Studies of deuterium-fueled Tokamak reactors  
16 p0435 A77-47357
- CHOI, S. I.  
Fuel cells and solid electrolytes [AD-A033782]  
15 p0366 N77-24630
- CHOKIN, SH. CH.  
Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance  
13 p0020 A77-12657
- CHOLEBA, V.  
Hydrogen separation and production from coal-derived gases using Fe/x/TiNi/1-x/  
16 p0458 A77-48821
- CHONIAK, J.  
Effects of devolatilization kinetics and ash behavior on coal fired MHD combustor design  
14 p0141 A77-21248
- CHOPRA, I.  
Wind energy conversion [PB-268718/4]  
16 p0559 N77-33667
- CHOPRA, O. K.  
Corrosion behavior of materials for coal-gasification applications  
15 p0337 A77-40029
- CHOU, J. C. S.  
Regenerative vapor cycle with isobutane as working fluid [PB-262704/0]  
15 p0356 N77-23622
- CHOU, J. L. S.  
Conceptual design of a 10MW regenerative isobutane geothermal power plant [PB-261563/1]  
15 p0349 N77-22683
- CHOU, T.-W.  
Optimization of composite flywheel design  
15 p0260 A77-31044
- CHOULET, R.  
Evolution of the concept of the automobile from the standpoint of saving energy  
13 p0051 A77-14562
- CHOWABINC, C. R.  
New concepts in solar photovoltaic electric power systems design  
13 p0038 A77-12817
- Silicon solar photovoltaic power stations [AIAA 77-1021]  
16 p0404 A77-41563
- CHRISTENSEN, D. L.  
Solar heating and cooling technical data and systems analysis [NASA-CN-150305]  
15 p0378 N77-26611
- CHRISTENSEN, R. H.  
Optimal design of anisotropic (fiber-reinforced) flywheels [UCRL-52169]  
16 p0522 N77-29616
- CHRISTIAN, J. C.  
Annual cycle energy system: Initial investigations [ORNL-TN-5525]  
15 p0364 N77-24599
- CHRISTMAN, B. C.  
Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB-255317/0]  
13 p0110 N77-12597
- CHROBOT, M.  
Application of simulation studies to the design and improvement of fuel control systems for aviation turbine engines  
13 p0054 A77-15798
- CHU, S. S.  
Silicon solar cells on unidirectionally recrystallized metallurgical silicon  
15 p0258 A77-30731
- Silicon solar cells on zone-melted silicon/graphite substrates  
16 p0426 A77-45303
- CHU, T. L.  
Reducing grain-boundary effects in polycrystalline silicon solar cells  
13 p0014 A77-11761
- Silicon solar cells on unidirectionally recrystallized metallurgical silicon  
15 p0258 A77-30731
- Silicon solar cells on zone-melted silicon/graphite substrates  
16 p0426 A77-45303
- Development of low cost thin film polycrystalline silicon solar cells for terrestrial applications [PB-266057/9]  
16 p0517 N77-28618
- CHUAN, D.  
Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia  
14 p0153 A77-21840
- CHUBB, T. A.  
Application of chemical engineering to large scale solar energy  
16 p0491 A77-49098
- Demand sensitive energy storage in molten salts  
16 p0491 A77-49102
- CHUKHANOV, Z. F.  
Scientific-technological problems of the development of a fuel-energy complex in the USSR  
13 p0051 A77-14703
- CHUMAKOV, V. M.  
Quasi-analog models of large systems of algebraic equations  
16 p0433 A77-46959
- CHUN, L.  
Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations  
16 p0428 A77-46250
- CHUNG, D.  
Storage of solar energy by inorganic oxide/hydroxides  
16 p0492 A77-49109
- CHUNG, S. Y.  
Wind energy conversion [PB-268718/4]  
16 p0559 N77-33667
- CICCARELLA, G.  
An automatic solar disk tracking system for incident energy measurements  
14 p0138 A77-20749
- CICHANOWICZ, J. E.  
Environmental aspects of low Btu gas combustion  
16 p0440 A77-48178

- CILIANO, R.  
Comparative state-of-the-art assessment of gas supply modeling  
[EPRI-BA-201] 16 p0539 N77-31656
- CIPRIOS, G.  
Redox bulk energy storage system study, volume 1  
[NASA-CR-135206-VOL-1] 16 p0553 N77-33608  
Redox bulk energy storage system study, volume 2  
[NASA-CR-135206-VOL-2] 16 p0553 N77-33609
- CIRPIOS, G.  
An environmental assessment of a 638 MWe molten carbonate fuel cell power plant 16 p0453 A77-48781
- CISZEK, T. P.  
Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149815] 14 p0227 N77-19898  
Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149814] 14 p0227 N77-19899
- CITRON, O. E.  
Institutional and environmental aspects of geothermal energy development 15 p0291 A77-35016
- CITRON, S. J.  
Optimization of automotive engine fuel economy and emissions 15 p0320 A77-38373
- CLAMPITT, B. E.  
Energy recovery from saline water by means of electrochemical cells 13 p0013 A77-11536
- CLARK, A. P.  
Shallow solar ponds for industrial process heat - The ERDA-Schio project 16 p0482 A77-49024  
Solar industrial steam 16 p0482 A77-49029  
LIL-Sohio solar process heat project. Report no. 3: LIL solar energy group  
[UCID-16630-3] 13 p0123 N77-14604  
Industrial process heat from shallow solar ponds  
[UCRL-77801] 13 p0124 N77-14611  
Solar industrial steam  
[UCRL-77895] 14 p0231 N77-20592  
Shallow solar ponds for industrial process heat: The ERDA-SOHIO project  
[UCRL-78288] 14 p0232 N77-20601
- CLARK, B. R.  
Approaches to chemical class analyses of fossil derived materials  
[CONF-770301-5] 16 p0532 N77-31271
- CLARK, J. A.  
Continuous solar air conditioning with ammonia/water absorption cycle 14 p0182 A77-26057
- CLARK, J. W.  
Assessing the relationship between urban form and travel requirements: A literature review and conceptual framework  
[PB-254588/9] 13 p0102 N77-11923
- CLARK, R.  
A solar home for low income families 16 p0476 A77-48970  
A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families 16 p0479 A77-48998
- CLARK, R. H.  
Progress of feasibility reassessment of exploiting Fundy tidal energy 16 p0439 A77-47971
- CLARKE, E. C.  
Solar energy subsystems employing isothermal heat sink materials  
[PB-258738/4] 14 p0233 N77-20616
- CLARKE, G. E.  
Flight test development of a helicopter-towed surface delivery system 15 p0317 A77-38006
- CLARKE, P. J.  
Investigation and assessment of light-duty-vehicle evaporative emission sources and control  
[PB-255813/8] 13 p0102 N77-11603
- CLARKEY, A.  
Development of large size nickel-zinc cells for electric vehicles 14 p0161 A77-22911
- CLAUSING, A. H.  
Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber 14 p0204 A77-29594  
The performance of a stationary reflector/tracking absorber solar concentrator 16 p0474 A77-48954  
Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber  
[SAND-76-8663] 14 p0248 N77-21674  
Potential of a solar collector with a stationary spherical reflector and a tracking absorber for electrical power production  
[SAND-76-8039] 15 p0345 N77-22616
- CLAUVERIE, R.  
Solar electric power generating stations in space - XXI century energy or a utopia 15 p0269 A77-32470
- CLAYTON, R. H.  
Reduction of gaseous pollutant emissions from gas turbine combustors using hydrogen-enriched jet fuel  
[NASA-CR-149146] 13 p0094 N77-11198
- CLEAR, R.  
Analysis of the California energy industry  
[LBL-5928] 16 p0557 N77-33640
- CLEARY, L. D.  
Electric utility solar energy activities, 1976 survey  
[EPRI-ER-321-SR] 16 p0515 N77-28598
- CLEAVER, A. V.  
On the realisation of projects - With special reference to O'Neill space colonies and the like 16 p0431 A77-46770
- CLECHET, P.  
Description of a new photoelectrochemical generator 14 p0150 A77-21812
- CLEMENTS, A. C.  
Self sufficient energy integrated design and construction method for low cost-self help housing programs 16 p0495 A77-49117
- CLEMENTS, L. L.  
Fiber composite program for flywheel applications  
[UCRL-50033-76-1] 15 p0345 N77-22633
- CLEMENTS, R. H.  
Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821
- CLEMOT, M.  
Water pumping - A practical application of solar energy 13 p0079 A77-19117
- CLENDINNING, W. A.  
Proceedings of Second Geopressed Geothermal Energy Conference. Volume 4: Surface technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- CLICK, C. H.  
Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157
- CLIFFORD, J. E.  
Electric vehicle batteries - Opportunities for materials improvement 13 p0049 A77-11736  
An off-peak energy storage concept for electric utilities. I - Electric utility requirements 16 p0499 A77-49348
- CLIQUE, M.  
Linear model of a dissipative PWM shunt regulator 13 p0080 A77-19172
- CLOSE, D. J.  
Use of adsorbent beds for energy storage in drying of heating systems 16 p0405 A77-41577
- CLOSHANN, P. J.  
Soluble-salt processes for in-situ recovery of hydrocarbons from oil shale 16 p0441 A77-48472
- CLOT, A.  
'Low-energy' geothermal heat 14 p0178 A77-23001
- CLUGSTON, D. H.  
Sulfur compounds in oils from the Western Canada Tar Belt 14 p0169 A77-23553

- CNARE, E. C.  
PULSAR, an unconventional topping stage  
13 p0034 A77-12788  
Pulsed energy conversion with a dc superconducting magnet  
13 p0081 A77-19293  
PULSAR - A flux compression stage for coal-fired power plants  
14 p0190 A77-26544
- COBBLE, H. H.  
Parametric studies of the thermal trap flat plate collector  
13 p0068 A77-18443  
Optimal overall efficiency for a solar radiation collector utilizing a twc fluid Rankine Cycle to generate electrical power  
14 p0182 A77-26056
- COCKSHUTT, E. P.  
Overview of Canadian activities in renewable energy resources  
16 p0469 A77-48912
- CODER, D. W.  
Hydrodynamic equilibrium conditions for AG(EH) main strut-pod foil system using flap incidence control  
[AD-A027521] 13 p0127 N77-15220
- COEN-PORISINI, P.  
The compatibility of containment materials for thermochemical hydrogen production  
15 p0276 A77-33347
- COFFARI, E.  
Termosole flat plate collectors  
13 p0073 A77-19058  
A mathematical model for the digital computation of the hours of sunshine on an inclined plane  
14 p0166 A77-23382
- COFFINBERRY, G. A.  
Oil cooling system for a gas turbine engine  
[NASA-CASE-LEN-12830-1] 15 p0353 N77-23106
- COFFOU, E.  
The question of the utilization of geothermal energy in dry rocks /dry walls/  
15 p0303 A77-36348
- COHEN, A. D.  
A summary of solar heating and cooling of buildings /SHACOB/ - Phase I demonstration planning studies  
13 p0039 A77-12821
- COHEN, A. S.  
Air pollution and the siting of fossil fuel power plants  
[ANL-76-XX-14] 15 p0386 N77-26708
- COHEN, D. B.  
Anaerobic sludge digestion - A potential energy source  
16 p0439 A77-47970
- COHEN, L. H.  
Alternate petroleum based fuels for naval fleet usage: potential availability, cost, and system impact  
[AD-A041980] 16 p0551 N77-33372
- COHEN, M.  
Metallurgical evaluation of materials for geothermal power plant applications  
16 p0499 A77-49700
- COHN, P. D.  
Recommendations for a US geothermal research plan, volume 1  
[PB-261566/4] 15 p0346 N77-22640  
Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641  
Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642  
Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- COHN, S.  
Improved engineering-economic model of residential energy use  
[ORNL-COH-8] 16 p0557 N77-33644
- COLCORD, A. R.  
Clean fuels from agricultural and forestry wastes  
[PB-259956/1] 14 p0233 N77-20610
- COLE-APPEL, B. E.  
A method of comparing flat-plate air and liquid solar collectors for use in space heating applications  
16 p0472 A77-48941  
Performance of air-cooled flat plate collectors  
16 p0472 A77-48942
- COLE, B. H.  
ENFORM: An energy information system  
[BNWL-2195] 16 p0542 N77-32016
- COLE, F. T.  
Particle Accelerator Conference: Accelerator Engineering and Technology, Chicago, Ill., March 16-18, 1977, Proceedings  
15 p0334 A77-39742
- COLE, J. W.  
Operations research investigations of satellite power stations  
[NASA-TN-X-73372] 14 p0236 N77-21547
- COLE, K.  
User's guide to petroleum industry survey data type  
[PB-256635/4] 13 p0098 N77-11544
- COLE, R.  
Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 N77-26988
- COLE, R. B.  
Hydrogen energy conversion  
[AD-A030370] 14 p0218 N77-18601
- COLE, R. L.  
Liquid-metal MHD - Cycle studies and generator experiments  
13 p0034 A77-12785
- COLE, T.  
Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator  
16 p0418 A77-43070
- COLEMAN, D. D.  
Isotopic characterization of Illinois natural gas  
13 p0113 N77-13484
- COLEMAN, G.  
Gravel and liquid storage system for solar thermal power plants  
16 p0491 A77-49101
- COLETTA, G. C.  
Design considerations for capillary heat pipes at cryogenic temperatures  
[ORNL-MIT-28] 15 p0361 N77-24430
- COLIN, E.  
A power plant of the Aerosolec type  
14 p0153 A77-21839
- COLLINS, T. A.  
Synthesis and analysis of jet fuel from shale oil and coal syncrudes  
[NASA-CR-135112] 13 p0103 N77-12230
- COLOMBES, J.  
Autonomous station for the acquisition and concentration of heliometric data  
13 p0072 A77-19046  
Procedure for characterizing flat plate solar collectors  
13 p0073 A77-19056  
Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation  
14 p0149 A77-21794  
Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system  
14 p0149 A77-21795
- COLP, J.  
Magma energy research project, volume 2, no. 2  
[SAND-76-0264-VOL-2-NO-2] 15 p0372 N77-25638
- COLTHARP, G. B.  
Utilization of remote sensing techniques to detect land use effects on wildland water quality  
13 p0071 A77-18984
- COLTON, C. B.  
Fuel gas environmental impact  
[PB-257134/7] 14 p0209 N77-16470
- COMBARNOUS, H. A.  
Free thermal convection in geothermal fields - Physical understanding and mathematical modeling  
14 p0174 A77-24204
- COMBESCURE, C.  
Thermoelectric conversion of solar energy by means of refractory B14Si compounds  
14 p0154 A77-21848

- COMBS, J.  
Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application  
[PB-262372/6] 15 p0347 N77-22654
- COMBS, L. P.  
Design criteria for reducing pollutant emissions and fuel consumption by residential oil-fueled combustors  
[ASME PAPER 76-WA/FU-10] 14 p0185 A77-26457
- COMFORT, W. J., III  
Performance of a total-flow impulse turbine for geothermal applications 16 p0456 A77-48808
- CONDIT, R. H.  
Reactions in the ZnSe thermochemical cycle for hydrogen production 14 p0178 A77-24854
- CONDIT, W. C.  
Field-reversed mirror as a D-T power reactor  
[UCRL-78082] 15 p0351 N77-22967
- CONGER, W.  
A thermochemical data bank for cycle analysis 15 p0276 A77-33346
- CONGER, W. L.  
Stage efficiency in the analysis of thermochemical water decomposition processes 13 p0047 A77-13538  
Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374  
Thermochemical hydrogen production via a cycle using barium and sulfur - Reaction between barium sulfide and water 15 p0321 A77-38529  
A thermochemical data bank for cycle analysis 14 p0238 N77-21578  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 14 p0240 N77-21608
- CONN, R. W.  
What is past is prologue: Future directions in Tokamak power reactor design research  
[UNFDM-175] 15 p0358 N77-23951
- CONN, W. D.  
Evaluating revenue sources for public transit - A new frontier for environmental planners 13 p0070 A77-18723
- CONNOR, W. H.  
Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5] 16 p0516 N77-28610
- CONNOLLY, M.  
Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists 16 p0497 A77-49157
- CONNOR, L. R.  
Cryogenic temperature control by means of energy storage materials  
[AIAA PAPER 77-763] 15 p0312 A77-37273
- CONSOLI, T.  
Supplementary plasma heating studies in the atomic energy commission, France 13 p0064 A77-17819
- CONSMORE, T. J.  
Potential environmental impacts of solar heating and cooling systems  
[PB-259970/2] 14 p0226 N77-19683
- CONSTANT, B.  
New modes of operation for avalanche diodes - Frequency multiplication and upconversion 13 p0049 A77-14261
- CONTE, A. A., JR.  
Antivear additives, wear studies on chemical addition agents for imparting an effective lubricating response in polysiloxane (silicone) fluids  
[AD-A033527] 15 p0340 N77-22270
- CONTI, M.  
Efficiency tests on a linear parabolic concentrator for medium and high temperatures 13 p0077 A77-19103
- Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297
- CONVERSE, A. O.  
Solar heating in northern New England 16 p0477 A77-48980  
Microcomputer processor for monitoring of solar heated buildings 16 p0481 A77-49015
- COOK, C. S.  
Argon contamination associated with ceramic regenerative heat exchangers for closed cycle MHD 15 p0326 A77-39536
- COOK, F.  
Evaluation of current surface coal mining overburden handling techniques and reclamation practices  
[PB-264111/6] 15 p0372 N77-25625
- COOK, G. E.  
Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- COOK, J.  
A passive solar heated house - Design and construction 16 p0476 A77-48989
- COOK, J. M.  
Cost estimation for a theta-pinch reactor  
[ANL-CTR-TM-40] 16 p0549 N77-32888
- COOK, K.  
Gravity and ground magnetic surveys of the central mineral mountains, Utah, volume 6  
[PB-268423/1] 16 p0544 N77-32578
- COOK, L. P.  
Crystallization and vaporization studies on synthetic coal slag compositions 14 p0140 A77-21228
- COOKE, P. W.  
Building energy conservation programs: A preliminary examination of regulatory activities at the state level  
[PB-268873/7] 16 p0559 N77-33673
- COOKSON, C.  
Definition study for photovoltaic residential prototype system  
[NASA-CR-135056] 13 p0113 N77-13533
- COONEY, C. L.  
Fuel gas recovery from controlled landfilling of municipal wastes 13 p0070 A77-18739  
Packed bed digestion of solid wastes 15 p0323 A77-39107
- COONLEY, D. R.  
The use of built form to enhance the output of wind collectors 16 p0490 A77-49090
- COONS, W. C.  
Metal dusting corrosion in coal gasification environments 15 p0337 A77-40042
- COOPER, C. E.  
Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment  
[PB-269270/5] 16 p0561 N77-34058
- COOPER, H. B. H., JR.  
Fuel conversion strategy impacts on compliance with photochemical oxidant standards 15 p0333 A77-39585
- COOPER, J.  
Measurement of dry deposition of fossil fuel plant pollutants  
[PB-264495/3] 15 p0376 N77-25685
- COOPER, R.  
JP-4 and JP-9 fuel toxicity studies using water fish and aufwuchs  
[AD-A027594] 13 p0127 N77-15213
- COOPER, R. F.  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser 15 p0326 A77-39532
- COOPER, R. L.  
California energy outlook  
[UCRL-5196-REV-1] 13 p0106 N77-12525

- COPASS, C. R.**  
A solar heating system simulation model 15 p0319 A77-38222
- CORF, J.**  
Modeling residential energy use 13 p0027 A77-12726  
Engineering-economic model of residential energy use [ORNL-TM-5470] 14 p0231 N77-20580  
Improved engineering-economic model of residential energy use [ORNL-COR-8] 16 p0557 N77-33644
- CORLEW, T. B.**  
Cooperative geochemical resource assessment of the Mesa Geothermal system [PB-257225/3] 13 p0132 N77-15520
- CORRETT, R. G.**  
Effects of coal mining on ground and surface water quality, Monongalia County, West Virginia 16 p0400 A77-41211
- CORDEO, J.**  
Design and performance of high temperature ceramic electrode modules 15 p0327 A77-39543
- CORMAN, J. C.**  
Conceptual design of closed Brayton cycle for coal-fired power generation 16 p0445 A77-48714  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary [NASA-CR-134949-VOL-1] 15 p0379 N77-26631  
Energy Conversion Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach [NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results [NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment [NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- CORNELL, R. F.**  
Advanced motor developments for electric vehicles 15 p0305 A77-36615
- CORNWELL, L.**  
An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207
- COROTIS, R. B.**  
Stochastic modelling of site wind characteristics [PB-261178/8] 15 p0351 N77-22775
- CORREA, J. H.**  
Application of the Alstom/Exxon alkaline fuel cell system to utility power generation [EPRI-EM-384] 16 p0557 N77-33643
- CORSETTI, J. S.**  
Projects to expand fuel sources in western states. Survey of planned or proposed coal oil shale, tar sand, uranium, and geothermal supply expansion projects, and related infrastructure, in states west of the Mississippi River (as of May 1976) [PB-265633/8] 16 p0516 N77-28614
- CORSO, S.**  
Porous electrodes for Zn/air alkaline battery 16 p0431 A77-46722
- CORTES, R.**  
Double-reflection solar energy concentrators 13 p0074 A77-19067
- COSBY, R. M.**  
An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator 16 p0473 A77-48952  
The linear Fresnel lens solar concentrator: Transverse tracking error effects [NASA-CR-2889] 16 p0521 N77-29606  
Solar concentration by curved-base Fresnel lenses [NASA-CR-2890] 16 p0524 N77-29946
- COSTA, A.**  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project [ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- COSTAIN, J. K.**  
Evaluation and targeting of geothermal energy resources in the southeastern United States [VPI-SU-5103-1] 14 p0225 N77-19642
- COSTE, W. B.**  
Evaluating a combined wind power/energy storage system 15 p0287 A77-33596
- COSTELLO, F. A.**  
The design of a sodium sulfate decahydrate heat exchanger for coolness storage 16 p0450 A77-48760  
Stimulation of the solar industry by way of the Federal Buildings Program 16 p0462 A77-48850  
The Page-Jackson Elementary School solar heating and cooling system 16 p0462 A77-48851
- COSTOGUE, E. W.**  
Comparison of candidate solar array maximum power utilization approaches 13 p0041 A77-12836  
Performance data for a terrestrial solar photovoltaic/water electrolysis experiment 15 p0256 A77-30321
- COTTINGHAM, J. G.**  
Attic concentrator type solar energy collector [BHL-50493] 13 p0098 N77-11539
- COTY, U.**  
The high potential of wind as an energy source 14 p0183 A77-26084  
Implementation issues of wind energy [AIAA 77-1025] 16 p0404 A77-41565
- COULTAS, T.**  
An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207
- COULTAS, T. A.**  
Cost estimation for a theta-pinch reactor [ANL-CTE-TM-40] 16 p0549 N77-32888
- COUPE, L. D.**  
Pumped storage potential of the Hell's Canyon area [PB-267722/7] 16 p0539 N77-31664
- COUTINHO, J. DE C.**  
Risk management of liquefied natural gas installations 13 p0002 A77-10451
- COVAULT, D. O.**  
Conference report: Energy Conservation in Transportation and Construction [PB-255857/5] 13 p0100 N77-11562
- COVENEY, D. B.**  
Energy equivalents for current and prospective automotive fuels in Canada [AD-A026195] 13 p0124 N77-14609
- COWAN, H.**  
PULSAR, an unconventional topping stage 13 p0034 A77-12788  
Pulsed energy conversion with a dc superconducting magnet 13 p0081 A77-19293  
PULSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544
- COWLES, J. O.**  
In situ recovery of oil and minerals from Piceance Creek Basin oil shale 13 p0023 A77-12694
- COX, K.**  
A thermochemical data bank for cycle analysis 15 p0276 A77-33346
- COX, K. E.**  
Hydrogen from solar energy via water electrolysis 13 p0032 A77-12771  
Stage efficiency in the analysis of thermochemical water decomposition processes 13 p0047 A77-13538  
Hydrogen production via thermochemical cycles based on sulfur chemistry 13 p0048 A77-13541  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes 15 p0279 A77-33374  
Irreversibilities in thermochemical cycles for hydrogen production by water decomposition 16 p0457 A77-48816  
A thermochemical data bank for cycle analysis 14 p0238 N77-21578

- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
14 p0240 N77-21608
- COY, P. A.  
A study to obtain verification of Liquid Natural Gas (LNG) tank loading criteria  
[AD-A025716] 13 p0120 N77-14492
- COKE, E. F.  
Feasibility study of an Integrated Energy/Utility System at the University of Florida  
16 p0449 A77-48751
- CRAAE, J. E. A.  
Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion  
14 p0161 A77-22910
- CRAFOORD, C.  
An estimate of the interaction of a limited array of windmills  
[DM-16] 13 p0114 N77-13539
- CRAIG, A. G., JR.  
The Alcoa 655 selective surface for aluminum  
16 p0487 A77-49063  
Application of aluminum alloys for solar heating and cooling systems  
16 p0487 A77-49068
- CRAIG, H.  
Production of atmospheric nitrous oxide by combustion  
13 p0061 A77-16922
- CRAIG, J. I.  
Design and simulation studies for the Shenandoah Community Center large-scale solar cooling demonstration  
[ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520  
The Shenandoah Solar Community Center  
16 p0476 A77-48974
- CRAIG, J. W. T.  
Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3  
[PB-268492/6] 16 p0548 N77-32615
- CRAIGHEAD, H. G.  
Optical properties of selectively absorbing Ni/Al<sub>2</sub>O<sub>3</sub> composite films  
16 p0502 A77-50281
- CRANER, J. J.  
Northeastern utilities are meeting the clean air challenge  
16 p0424 A77-44612
- CRANE, D. P.  
United States Postal Service Electric Vehicle Program  
14 p0161 A77-22912
- CRAWFORD, L. W.  
Investigation of direct coal-fired MHD power generation  
13 p0034 A77-12783  
Slag layers in direct coal-fired MHD power generation  
14 p0139 A77-21224  
Materials utilization in a direct coal-fired MHD generator system  
15 p0292 A77-35151  
Generator wall slag coating and material corrosion experiments  
15 p0327 A77-39542  
A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- CRAWFORD, R. B.  
Energy and technology review  
[UCRL-52000-76-8] 15 p0345 N77-22627
- CRAWFORD, R. J.  
The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study  
16 p0438 A77-47765
- CREBS, T. J.  
Gravity and ground magnetic surveys of the central mineral mountains, Utah, volume 6  
[PB-268423/1] 16 p0544 N77-32578
- CRECELIOUS, R. A.  
Mercury emissions from geothermal power plants  
15 p0289 A77-34428
- CRECRAFT, B.  
Ultralightweight solar array for Naval Sea Control Systems  
13 p0040 A77-12828
- CREEDON, J. E.  
A half megawatt Pulse Forming Network (PFN)  
[AD-A039709] 16 p0526 N77-30373
- CREMER, H.  
Hydrogen production using nuclear heat  
13 p0057 A77-16211  
Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur-families  
15 p0275 A77-33342  
Balance and optimization procedure for thermochemical cycles for hydrogen production  
15 p0276 A77-33345  
Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families  
14 p0238 N77-21572
- CREMER, J.  
OPEC and the monopoly price of world oil (World Oil Project)  
[PB-265015/8] 16 p0518 N77-29001
- CRENSHAW, R. W.  
Window design strategies to conserve energy  
[PB-269297/8] 16 p0559 N77-33669
- CRESWICK, P. A.  
Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere  
[PB-253375/0] 13 p0092 N77-10715
- CRIM, W. H.  
ERDA's gas turbine development program for the next decade  
13 p0011 A77-11324
- CRIZUI, E.  
Cost aspects of solar energy - Selective and critical bibliography  
13 p0054 A77-15799
- CRNEKOVICH, P.  
Cost estimation for a theta-pinch reactor  
[ANL-CTR-TM-40] 16 p0549 N77-34888
- CRONACK, D. E.  
Design and operational evaluation of a 25 kW wind turbine generator for residential heating applications  
16 p0468 A77-48901  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project  
[ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- CROW, C. J.  
Metallurgical evaluation of materials for geothermal power plant applications  
16 p0499 A77-49700
- CROWAUER, D. C.  
Characterization of synthetic liquid fuels  
14 p0169 A77-23554
- CROOK, D. L.  
Optimization of silicon solar cell design for use under concentrated sunlight  
15 p0257 A77-30714
- CROOKES, R. J.  
Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio  
15 p0293 A77-35186
- CROSS, E. J., JR.  
Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft  
[SAE PAPER 770470] 15 p0310 A77-37088
- CROUCH, W. B.  
Solids gasification for gas turbine fuel 100 and 300 Btu gas  
13 p0022 A77-12685
- CROUZET-PASCAL, J.  
A non-aerospace application of plans: Preliminary structural design of wind turbine diffuser  
[RM-629] 16 p0534 N77-31604
- CROWDER, G. W.  
The feasibility of solar energy usage on Red River Army Depot  
[AD-A025119] 13 p0108 N77-12535



- CRUMP, L. H.  
 Historical fuels and energy consumption data, 1960  
 - 1972, United States by states and census  
 districts east of the Mississippi  
 [PB-255176/0] 13 p0112 N77-13229  
 Historical fuels and energy consumption data, 1960  
 - 1972, United States by states and census  
 districts west of the Mississippi  
 [PB-255177/8] 13 p0112 N77-13230  
 Fuels and energy data: United States by states  
 and census divisions, 1973  
 [PB-262362/7] 15 p0367 N77-24636
- CRUTZEN, P. J.  
 Effects of nitrogen fertilizers and combustion on  
 the stratospheric ozone layer 15 p0290 A77-34895
- CRUZ, I. E.  
 Producer gas from agricultural wastes - Its  
 production and utilization in a converted  
 oil-fired boiler 15 p0323 A77-39106
- CUDDIHY, E. F.  
 Consideration of encapsulants for photovoltaic  
 arrays in terrestrial applications 14 p0203 A77-29580
- CUNNINGHAM, C. E.  
 East Mesa Geothermal Component Test Facility  
 14 p0178 A77-25136
- CUNNINGHAM, K. L.  
 Energy and technology review  
 [UCRL-52000-76-8] 15 p0345 N77-22627
- CUOMO, J. J.  
 Reduction of grain boundary recombination in  
 polycrystalline silicon solar cells 14 p0181 A77-25999
- CUPPS, C. O.  
 Field experiment of in-situ oil recovery from a  
 Utah tar sand by reverse combustion 14 p0193 A77-27348
- CURRAN, H. M.  
 Coefficient of performance for solar-powered space  
 cooling systems 16 p0475 A77-48965  
 Comparative evaluation of solar heating alternatives  
 [COC-2703-2] 13 p0129 N77-15498  
 Coefficient of performance for solar-powered space  
 cooling systems  
 [CONF-760618-1] 14 p0220 N77-19585
- CURRAN, L. M.  
 Systems study of fuels from sugar cane, sweet  
 sorghum, and sugar beets  
 [TID-27032] 14 p0211 N77-17570
- CURRAW, S.  
 Energy resources available to man 16 p0402 A77-41422
- CURRIE, J. W.  
 Potential for producing and marketing gasoline  
 substitutes from western coal  
 [BNWL-2080(RAP-4)] 15 p0340 N77-22291
- CURRY, B. P.  
 Consideration of three-dimensional effects in MHD  
 power generators 14 p0142 A77-21261
- CURRY, H.  
 Influence of selected Federal statutes on energy  
 development  
 [BNWL-2084(RAP-5)] 15 p0346 N77-22638
- CURTIS, H.  
 Fundamental studies of black chrome for solar  
 collector use 16 p0498 A77-49160
- CURTIS, H. B.  
 Optimized selective coatings for solar collectors  
 [NASA-TM-X-73498] 13 p0097 N77-11529
- CURTNER, K. L.  
 Conceptual heliostat field design for the ERDA 5  
 Megawatt Solar Thermal Test Facility at Sandia,  
 Albuquerque 15 p0318 A77-38209  
 Heliostat field design for the ERDA 5 Megawatt  
 Solar Thermal Test Facility 16 p0484 A77-49040
- CUTTICA, J. J.  
 ERDA's Bicentennial Thermionic Research and  
 Technology Program 13 p0042 A77-12861
- CUTTING, J.  
 Investigation of two-phase liquid-metal  
 magnetohydrodynamic power systems 13 p0057 A77-16212  
 Experimental two-phase liquid-metal  
 magnetohydrodynamic generator program  
 [AD-A035245] 15 p0387 N77-26988
- CUTTING, J. C.  
 Influence of coal type and drying upon MHD power  
 plants and components 14 p0140 A77-21231  
 Development of a baseline reference design for an  
 open cycle MHD power plant for commercial service  
 14 p0140 A77-21232  
 Calculation of end effects in open-cycle MHD power  
 generators 15 p0329 A77-39558  
 Status of the reference dual-cycle MHD-steam power  
 plant 15 p0332 A77-39577  
 Open-cycle coal burning MHD power plants for  
 commercial service 15 p0333 A77-39578
- CWIBERTNY, A. J.  
 Composites for large space structures  
 [IAF PAPER 77-65] 16 p0507 A77-51416
- CZECHOWSKI, P.  
 Multi-stage activation of brown-coal chars with  
 oxygen 16 p0401 A77-41319

## D

- DAEHLER, K.-D.  
 Optimal thermal insulation as an  
 investment-computational problem 13 p0009 A77-11268
- DAG REPPEN, H.  
 Impact of advanced fuel fusion on electric power  
 transmission 16 p0436 A77-47361
- DAIE, S. J.  
 Soot and gaseous pollutant formation in a burning  
 fuel spray in relation to pressure and air/fuel  
 ratio 15 p0293 A77-35186
- DAIELLO, R.  
 Epitaxial silicon technology for low-cost solar  
 cells  
 [PB-262396/5] 15 p0374 N77-25663
- DAILY, J. W.  
 Boundary layer measurements of temperature and  
 electron number density profiles in a combustion  
 MHD generator 15 p0288 A77-33710
- DALAL, V. K.  
 Design considerations for high-intensity solar cells  
 14 p0179 A77-25591
- DALEN, V.  
 A finite element model for the analysis of  
 waterflood performance  
 [STP71-A75036] 16 p0551 N77-33464
- DALESSANDRO, J.  
 Design considerations for a noncircular Tokamak  
 demonstration plant  
 [GA-A-14074] 15 p0351 N77-22968
- DALESSIO, G. J.  
 Western energy/environment monitoring study:  
 Planning and coordination summary  
 [PB-266256/7] 16 p0523 N77-29632
- DALETSKII, G. S.  
 Use of radiation reflected from earth to increase  
 the power of solar panels 15 p0363 N77-24586
- DALIBOT, B.  
 Encapsulation of solar cell modules 13 p0076 A77-19092  
 100 kilowatt-hours per day with BTC silicon solar  
 cells 14 p0153 A77-21835
- DANIEL, A.  
 Water electrolysis under pressure - Improvement of  
 energy efficiency by temperature increase 15 p0277 A77-33360  
 Water electrolysis under pressure: Improvement of  
 energy efficiency by temperature increase 14 p0238 N77-21594

- DAMMANN, E. E.  
Development of plastic honeycomb flat-plate solar collectors  
[S&N/1081-76/1] 15 p0372 N77-25640
- DANA, M. T.  
Precipitation scavenging of fossil-fuel effluents  
[PB-256649/5] 13 p0124 N77-14630
- DANEY, D. E.  
Helium research in support of superconducting power transmission  
[PB-265676/0] 15 p0390 N77-27326
- DANFELT, E. L.  
Optimization of composite flywheel design 15 p0260 A77-31044
- DANG, V.-D.  
Parametric studies of applications of controlled thermonuclear reactor fusion energy for food production 14 p0194 A77-27356
- DANILOV, IU. I.  
Extraterrestrial resources and astronautics 16 p0499 A77-49400
- DANTZIG, G. B.  
Energy models and large-scale systems optimization [AD-A033736] 15 p0365 N77-24619
- DAO, K.  
Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures 16 p0475 A77-48962
- DAPKUS, P. D.  
High-efficiency GaInAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741
- DARCAZALLI, G.  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project [ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- DARLING, S. L.  
A unitized 500-megawatt fluidized bed boiler design 16 p0453 A77-48786
- DARNELL, D. W.  
National Airlines Fuel Management and Allocation Model 16 p0419 A77-43399
- DAROLLES, J. E.  
Thermoelectric conversion of solar energy by means of refractory B14Si compounds 14 p0154 A77-21848
- DARROW, K.  
Commodity hydrogen from off-peak electricity 15 p0283 A77-33403  
Commodity hydrogen from off-peak electricity 14 p0245 N77-21641
- DARROW, K. G., JR.  
Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock 14 p0200 A77-29437
- DART, R. H.  
The economic generation of electricity from moderate temperature geothermal resources 13 p0030 A77-12749
- DASE, W. G.  
Energy storage and transfer with homopolar machine for a linear theta-pinch hybrid reactor [LA-6174] 14 p0214 N77-17892
- DATTA, R. S.  
Desulfurization of coal by use of chemical combination 16 p0418 A77-43009
- DAUZVARDIS, P.  
Cost estimation for a theta-pinch reactor [ANL-CTR-TN-40] 16 p0549 N77-32888
- DAUZVARDIS, P. V.  
Sodium-nitrogen liquid-metal MHD facility initial test results 15 p0327 A77-39539
- DAYE, J. V.  
Validity of the isotropic-distribution approximation in solar energy estimations 16 p0422 A77-44477
- DAVENPORT, W.  
Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies [AD-A034995] 15 p0377 N77-26491
- DAVID, J. P.  
Alternating photoelectrochemical converters 13 p0077 A77-19093  
Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters 14 p0151 A77-21814
- DAVIDHEISER, R.  
Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies [AD-A034995] 15 p0377 N77-26491
- DAVIDSON, M.  
Assessment of the socio-economic and environmental aspects of the central receiver power plants 16 p0494 A77-49122  
Investment planning in the energy sector [LBL-4474] 13 p0125 N77-14948  
Ecological considerations of the solar alternatives [LBL-5927] 16 p0558 N77-33655
- DAVIDSON, R. C.  
Review of toroidal theta-pinch theory 16 p0427 A77-45628
- DAVIDUK, M.  
Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process 13 p0023 A77-12691
- DAVINI, P.  
Catalytic action of combustion-product deposits in the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the combustion chambers and exhaust channels of thermoelectric plants 16 p0420 A77-44179
- DAVIS, A.  
The influence of the properties of coals on their conversion into clean fuels 13 p0009 A77-11245
- DAVIS, A. J., III  
Feasibility studies of a biochemical desulfurization method 14 p0170 A77-23562
- DAVIS, B.  
Space: A resource for earth - An AIAA review 15 p0269 A77-32440
- DAVIS, B. W.  
A generalized numerical model for predicting energy transfers and performance of large solar ponds 16 p0482 A77-49025
- DAVIS, D. D.  
Battery-flywheel hybrid electric power system for near term application. Volume 2: System design [UCID-17098-VOL-2] 14 p0228 N77-20443
- DAVIS, E. E.  
Transportation options for solar power satellites 13 p0040 A77-12829  
Power satellite construction location considerations 16 p0463 A77-48869
- DAVIS, E. S.  
Solar energy in buildings: Implications for California energy policy [NASA-CR-152686] 15 p0343 N77-22613  
Options for demonstrating the use of solar energy in California buildings [NASA-CR-154103] 16 p0513 N77-28582
- DAVIS, H. P.  
Solar power satellite transportation 14 p0205 A77-30016  
Space solar power - The transportation challenge [AIAA PAPER 77-529] 15 p0266 A77-32054
- DAVIS, H. E.  
Bioconversion of agricultural wastes for pollution control and energy conservation [TID-27164] 15 p0383 N77-26675
- DAVIS, J. H.  
A status report on the USAFA solar energy program 16 p0478 A77-48993  
Solar heating retrofit of military family housing [AD-A030843] 14 p0226 N77-19659
- DAVIS, J. P.  
A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255658/7] 13 p0115 N77-13542  
A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255659/5] 13 p0115 N77-13543

- DAVIS, L. K.  
Coal fired non-equilibrium closed cycle MHD power plant system since ECAS  
15 p0332 A77-39576
- DAVIS, R. H.  
Energy: The policy planning framework in state governments. Volume 1: Summary report [PB-254466/6] 13 p0089 N77-10665  
Energy: The policy planning framework in state governments. Volume 2: Appendices [PB-254467/4] 13 p0089 N77-10666
- DAVIS, S. J.  
Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source 16 p0425 A77-44675  
Identifying and analyzing methods for reducing the energy consumption of helicopters [NASA-CR-144953A] 15 p0388 N77-27104
- DAVIS, W. T.  
Power generation: Air pollution monitoring and control 16 p0504 A77-51126
- DAVISON, R. R.  
Reinforced pillow solar water heater 16 p0493 A77-49114  
Further development of the compressed-film floating-deck solar water heater [PB-268514/7] 16 p0547 N77-32603
- DAVITIAN, H. E.  
IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125] 13 p0122 N77-14594
- DAWSON, J.  
Buying solar [PB-262134/0] 15 p0348 N77-22673
- DAWSON, J. K.  
The hydrogen economy 13 p0006 A77-11041
- DAY, J. A.  
A generalized numerical model for predicting energy transfers and performance of large solar ponds 16 p0482 A77-49025
- DAY, J. W., JR.  
Oil and gas use characterization, impacts, and guidelines [PB-265267/5] 16 p0516 N77-28610
- DAY, W. H.  
Coal gasifier projects gather momentum 14 p0184 A77-26290
- DAYAN, J.  
Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- DAYE, C. J.  
Comparing alternative methods of improving fuel economy 16 p0443 A77-48702
- DAYEN, M. J.  
Occupational radiation exposure at light water cooled power reactors, 1969-1975 [PB-257054/7] 13 p0125 N77-14740
- DE ARAUJO, S. R.  
Performance of an annular cylindrical solar collector 13 p0073 A77-19059
- DE BACKER, H.  
Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813
- DE BARTOLO, G.  
A methodological survey of energy modeling 14 p0177 A77-24592
- DE BENI, G.  
Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- DE BOER, P. C. T.  
Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 15 p0284 A77-33409
- DE CARNOY, G.  
Energy policies of France, Britain, and Germany compared 15 p0263 A77-31572
- Comparative energy policies of France, England, and Germany. II - Electricity and nuclear energy 15 p0324 A77-39505
- DE CARVALHO, A. V., JR.  
Solar powered steam generation 16 p0459 A77-48832
- DE GOEYSE, A.  
A combined cycle with a partial-oxidation reactor 13 p0062 A77-17534
- DE HELLO, E. W.  
Impact of advanced fuel fusion on electric power transmission 16 p0436 A77-47361
- DE RENZO, D. J.  
Energy from bioconversion of waste materials 16 p0407 A77-41649
- DE SARO, R.  
Slag flow and current transport in a simulated generator environment 15 p0330 A77-39562
- DE SCHAUWER, F.  
Application of solar energy in Belgium - Study of a flat plate collector 15 p0324 A77-39499
- DE SIQUEIRA, J. B.  
Solar powered steam generation 16 p0459 A77-48832
- DE SMET, J.  
Application of solar energy in Belgium - Study of a flat plate collector 15 p0324 A77-39499
- DE VOS, A.  
Calculation of the efficiency of a heterojunction solar cell 14 p0151 A77-21821  
Collection efficiency of heterojunction solar cells 15 p0258 A77-30722
- DE WINTER, P.  
The financial incentives for the fabrication of improved absorption coatings for the flat plate collector 16 p0487 A77-49066
- DE WINTER, T. A.  
Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet 14 p0144 A77-21391
- DE YOUNG, R. J.  
Power deposition in He from the volumetric He-3/n,p/H-3 reaction 16 p0426 A77-45307
- DEABLER, E. E.  
Materials and processing approaches to cost competitive wind turbine rotor blades 14 p0157 A77-22144
- DEAKIN, E. A.  
Transportation programming, economic analysis, and evaluation of energy constraints [PB-262878/2] 15 p0370 N77-25013
- DEAN, R. L.  
Conference report: Energy Conservation in Transportation and Construction [PB-255857/5] 13 p0100 N77-11562
- DEAN, T.  
Solar assisted heat pump air conditioning system 16 p0477 A77-48985  
The updated homesteader 16 p0495 A77-49136
- DEANGELIS, R. J.  
Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier [PB-268106/2] 16 p0543 N77-32295
- DEARDORFF, D. K.  
Spectral reflectance of TiN/x/ and ZnN/x/ films as selective solar absorbers 16 p0423 A77-44492
- DEB, S.  
Matching of solar cells and performance of a solar battery 15 p0256 A77-30316
- DEBOER, J.  
Hydrogen combustion. Part 1: Investigation of hydrogen flame control methods [CTI-IV-75-01449] 14 p0235 N77-21204
- DEBOER, P. C. T.  
Reciprocating pump for conversion of liquid hydrogen to high pressure gaseous hydrogen 14 p0245 A77-21647

- DECESARE, B. S.  
Recovering resources from urban refuse by the  
Bureau of Mines processes 15 p0292 A77-35158
- DECHAMBENOY, C.  
A surface thermal anomaly in the region of  
Chaudes-Aigues /France/ detected on aerial  
thermographs 13 p0014 A77-11591
- DECKER, G. L.  
The impact of the new energy technologies 15 p0272 A77-33124
- DECORA, A. W.  
The development of net energy estimates for  
extraction, handling, and processing of selected  
fuels 15 p0291 A77-35147
- DECOURSIN, D. G.  
Progress on the testing of refractories for  
directly-fired MHD air heater service 14 p0142 A77-21254
- DECRUOCCQ, D.  
Solubilization of coal in organic media  
[NASA-TN-75151] 15 p0390 A77-27498
- DEDERICK, P. K.  
NOx from fuel nitrogen in two-stage combustion 16 p0439 A77-48169
- DEHAVEN, J. C.  
The long-run marginal costs of energy  
[PB-252504/6] 13 p0085 A77-10625
- DEKKER, J. G.  
Solar heating in the United States  
[ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513
- DEL BEL, E.  
Economic feasibility of the conversion of organic  
waste to fuel oil and pipeline gas 15 p0302 A77-36346
- DEL BUENO, R. P.  
Design of the Montana Magnetohydrodynamics  
Component Development and Integration Facility 16 p0458 A77-48822
- DELAHOY, A. E.  
Factors which maximize the efficiency of Cr-p-Si  
Schottky /MIS/ solar cells 15 p0288 A77-34103
- DELEWE, J. G.  
Summary report: An exploratory study of cost  
targets for solar electric power plants  
[ORNL-TM-5787] 16 p0538 A77-31654  
Survey of nuclear fuel cycle economics: 1970 - 1985  
[ORNL-TM-5703] 16 p0561 A77-33968
- DELPOSSÉ, R. J.  
Evaluation of a JP-5 type fuel derived from oil  
shale [AD-A025417] 13 p0112 A77-13231
- DELL, R. E.  
Sodium/sulphur battery development in the United  
Kingdom 13 p0026 A77-12717
- DELMAS, E.  
High-sensitivity detection procedures and devices  
for angular variations - Application to  
automatic control of a solar furnace heliostat 14 p0166 A77-23386
- DENEO, E. A.  
Assessment of cadmium sulfide photovoltaic arrays  
for large scale electric utility applications  
[PB-255646/2] 13 p0109 A77-12551
- DENETTER, J. J.  
Combustion of pulverized, solvent-refined coal  
[ASME PAPER 76-WA/PU-6] 14 p0185 A77-26456
- DENETRIADES, S. T.  
Development of a baseline reference design for an  
open cycle MHD power plant for commercial service 14 p0140 A77-21232  
Coupled electrical and fluid calculations in the  
cross plane in linear MHD generators 15 p0329 A77-39557
- DEMETROULIS, M. E.  
Technical review and analysis of the total utility  
demonstration plant design and operational concept  
[AD-A037016] 15 p0398 A77-28040
- DEMICHELIS, P.  
Transmission solar focusing collector 15 p0334 A77-39671
- DEMIRJIAN, A.  
Electrode phenomena in slagging MHD channels 15 p0330 A77-39561
- DEMPSEY, R. E.  
Development of fuel cell CO detection instruments  
for use in a mine atmosphere [PB-254823/8] 13 p0095 A77-11380
- DEMUYCK, E.  
Compilation of an inventory for particulate  
emissions in Belgium 13 p0009 A77-11271
- DENNING, R. E.  
Variable geometry in the gas turbine - the  
variable pitch fan engine 15 p0339 A77-22148
- DENT, A. L.  
Catalytic synthesis of gaseous hydrocarbons  
[PB-1814-2] 13 p0130 A77-15503
- DENTON, J. C.  
Fuel economy potential of a combined engine  
cooling and waste heat driven automotive  
air-conditioning system 13 p0020 A77-12665  
Future energy production systems: Heat and mass  
transfer processes. Volume 1 13 p0056 A77-16201  
Perspectives for world energy production 13 p0056 A77-16202  
Heat and mass transfer for solar energy utilization 13 p0057 A77-16205  
Thermal energy storage for heating and air  
conditioning 13 p0057 A77-16206  
Future energy production systems: Heat and mass  
transfer processes. Volume 2 14 p0174 A77-24201  
Solar-thermal power systems 15 p0262 A77-31474  
Solar power systems 16 p0416 A77-42895  
Economic analysis of solar total energy systems 16 p0416 A77-42896
- DEPARADE, K.  
Cut energy costs: A guide for buying and plant  
operation 15 p0290 A77-34642
- DEPAUW, J. P.  
Test program for transmitter experiment package  
and heat pipe system for the communications  
technology satellite [NASA-TN-X-3455] 13 p0095 A77-11268
- DER KUNDEREN, W. J. G. J.  
Effects of wind fluctuations on windmill behaviour 16 p0410 A77-42073
- DERANUS, G. E., JR.  
Corrosion inhibitors for solar heating and cooling  
systems [NASA-TN-D-8409] 14 p0210 A77-17198
- DEER, V. E.  
Solar radiation atmospheric transmission research,  
phase 1 [PB-266010/8] 16 p0518 A77-28689
- DERRICKSON, R. A., JR.  
New England wind power...coastal or mountain 13 p0058 A77-16250
- DERVY, A. J.  
Harnessing the ocean waves, swells and tides 14 p0183 A77-26091
- DESARO, E.  
Slag interaction phenomena on MHD generator  
electrodes [AIAA PAPER 77-109] 14 p0135 A77-19833  
Replenishment processes and flow train interaction 14 p0139 A77-21223
- DESAUTEL, J.  
Focusing collectors of solar radiation 14 p0150 A77-21808
- DESCY, G. G.  
Solar heating for a sports complex in Belgium 16 p0417 A77-42958
- DESPLAT, J.-L.  
Near-uv photon efficiency in a TiO2 electrode -  
Application to hydrogen production from solar  
energy 13 p0015 A77-11947
- DESSUS, B.  
Interaction between the solar mirror field and the  
thermodynamic system of a turning solar power  
plant 14 p0151 A77-21824

- DETHAN, R.  
How six coal gasification processes compare economically  
14 p0165 A77-23308
- DETRE, J. P.  
Evolution of atmospheric pollution /high acidity and black fumes/ in France during 1975  
13 p0002 A77-10670
- DETHAN, R. E.  
The environmental effects of using coal for generating electricity  
[PB-267237/6]  
16 p0524 A77-29655
- DEUTSCH, M.  
Use of Landsat data for the detection of marine oil slicks  
15 p0267 A77-32244
- DEVANEY, W.  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications  
16 p0486 A77-49059
- DEVERALL, J. E.  
Gas-interface studies in large horizontal heat pipes  
[LA-6646-MS]  
16 p0520 A77-29455
- DEVIN, B.  
Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation  
14 p0149 A77-21794  
Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system  
14 p0149 A77-21795
- DEVINE, H. D.  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply  
14 p0179 A77-25224  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply  
[PB-263761/9]  
15 p0367 A77-24635
- DEVITT, T. W.  
Status of sulfur dioxide removal systems for the electric utility industry  
16 p0504 A77-51144
- DEWINTER, P.  
Description of the solar energy R and D programs in many nations  
[SAN/1122-76/1]  
14 p0225 A77-19648
- DEWINTER, J. W.  
Description of the solar energy R and D programs in many nations  
[SAN/1122-76/1]  
14 p0225 A77-19648
- DEWINTER, T. A.  
Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet  
[LA-UR-76-1809]  
14 p0235 A77-21325
- DEYO, J. B.  
Photovoltaic test and demonstration project  
14 p0153 A77-21838  
Status of the ERDA/NASA photovoltaic tests and applications project  
[NASA-TM-X-73567]  
13 p0114 A77-13537  
Recent developments in photovoltaic energy by ERDA/NASA-LeRC  
16 p0526 A77-30277
- DHARIA, D.  
Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries  
15 p0278 A77-33363  
Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries  
14 p0239 A77-21597
- DHARIA, D. J.  
Molten carbonate fuel cell model  
16 p0447 A77-48737
- DHARIVALL, S. E.  
Response of a partially illuminated solar cell  
14 p0139 A77-21025
- DHILLON, R.  
EPA and ERDA high-temperature/high-pressure particulate control programs  
[PB-266231/0]  
16 p0517 A77-28644
- DI MARCO, J. M.  
The magnetic energy storage system used in ZT-1  
15 p0299 A77-36314
- DI STEFANO, L.  
Efficiency tests on a linear parabolic concentrator for medium and high temperatures  
13 p0077 A77-19103
- DIAMOND, S.  
Solar heating and cooling of a 25,500 square foot building  
14 p0181 A77-26054  
The New Mexico Department of Agriculture solar heated and cooled building  
[ASME PAPER 76-WA/SOL-10]  
14 p0189 A77-26515  
A solar heated and cooled office building  
16 p0475 A77-48966
- DIAMOND, W. P.  
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia  
[PB-266769/9]  
16 p0527 A77-30589
- DIAZ, L. F.  
Energy recovery through biogasification of municipal solid wastes and utilization of thermal wastes from an energy-urban-agro-waste complex  
15 p0358 A77-24008
- DICK, E. P.  
Element rating and coupling harmonics in a superconductive energy transfer system  
16 p0411 A77-42164
- DICKEY, J. W.  
Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1]  
15 p0382 A77-26669
- DICKINSON, K. M.  
Argon contamination associated with ceramic regenerative heat exchangers for closed cycle MHD  
15 p0326 A77-39536
- DICKINSON, B. M.  
Microwave transmission system for space power  
13 p0014 A77-11818
- DICKINSON, W. C.  
The economics of industrial process heat from solar energy  
15 p0302 A77-36345  
Shallow solar ponds for industrial process heat - The ERDA-Sohio project  
16 p0482 A77-49024  
LLI-Sohio solar process heat project. Report no. 3: LLI solar energy group  
[UCID-16630-3]  
13 p0123 A77-14604  
Shallow solar ponds for industrial process heat: The ERDA-SOHIO project  
[UCRL-78288]  
14 p0232 A77-20601  
United States special format report: Performance of the Sohio Solar Water Heating System using large area plastic collectors (Grants, New Mexico)  
[SAN/1038-76/1]  
15 p0365 A77-24606
- DICKS, J. B.  
Investigation of direct coal-fired MHD power generation  
13 p0034 A77-12783  
Slag layers in direct coal-fired MHD power generation  
14 p0139 A77-21244  
Experimental investigation on a direct coal-fired MHD generator  
14 p0141 A77-21238  
Experimental investigation of multiple-loaded diagonal conducting wall generators  
15 p0325 A77-39529  
Generator wall slag coating and material corrosion experiments  
15 p0327 A77-39542  
Plasma luminosity fluctuations as a diagnostic tool  
15 p0328 A77-39547  
A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- DICKSON, E. M.  
Technology impact assessment of the hydrogen economy concept - Key findings  
15 p0284 A77-33414  
Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary  
[PB-255994/6]  
13 p0107 A77-12533  
Impacts of synthetic liquid fuel development. Automotive market. Volume 2  
[PB-255995/3]  
13 p0108 A77-12534

- Technology impact assessment of the hydrogen economy concept: Key findings 14 p0246 N77-21653
- Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7] 15 p0361 N77-24504
- Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system [PB-262513/5] 15 p0361 N77-24505
- The hydrogen economy: A preliminary technology assessment [PB-2666C7/1] 16 p0512 N77-28329
- DICKSON, J. C. Impact of fuel properties on jet fuel availability [AD-A029493] 14 p0219 N77-19278
- DIDENKO, V. I. Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply 15 p0272 A77-33170
- DIETRICH, A. P. Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705
- DIETRICH, G. Solar energy as contribution to the energy budget - Problems of storage 15 p0336 A77-39986
- DIETZMANN, H. E. Protocol to characterize gaseous emissions as a function of fuel and additive composition [PB-253363/6] 13 p0084 N77-10221
- DIKE, R. The magnetic energy storage system used in ZT-1 15 p0299 A77-36314
- DIKKERS, R. D. Development and implementation of standards for solar heating and cooling applications 16 p0469 A77-48913
- DILLON, R. R. Startup solvent selection for the liquefaction of lignite 13 p0059 A77-16472
- DILLON, T. S. Investigation into the use of large-scale total-energy systems in mild and warm climates 16 p0401 A77-41318
- DINI, D. Performance characteristics of turbo-rockets and turbo-ramjets using high energy fuel 15 p0339 N77-22131
- DIPPOLITO, R. Computer model of a solar-assisted heating design approach implemented on a minicomputer installation 15 p0318 A77-38178
- DISTEFANO, T. E. Reduction of grain boundary recombination in polycrystalline silicon solar cells 14 p0181 A77-25999
- DITTRICH, A. Economy of tap water heating in summer by means of solar energy 15 p0261 A77-31374
- DJAJIC, M. Some aspects of heat and mass transfer in geothermal wells 14 p0175 A77-24209
- DJORDJEVIC, N. A. Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions [ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508
- DRETHIN, V. I. Investigation of the mechanism of cleaning heating surfaces by the pulsation method [BLL-M-25448-(5828.4F)] 13 p0112 N77-13235
- DOBROZENSKY, E. Application of solar heat to buildings in Austria 13 p0079 A77-19114
- DOCKTER, L. Combustion of oil-shale carbon residue 14 p0193 A77-27343
- DODD, H. M., JR. An assessment of mechanical energy storage for solar systems 16 p0460 A77-48839
- DOENITZ, W. Hydrogen production with HOT ELLI 15 p0269 A77-32404
- DOGARU, J. The influence of finite electrode segmentation on electrical performances of the Faraday HD generator 15 p0309 A77-36936
- DOGNIAUX, R. Computational program for accurate predetermination of irradiance and illuminance in connection with solar energy utilization 14 p0147 A77-21777
- DOHERTY, M. A. On the energy pattern factor in wind measurements 15 p0322 A77-38788
- DOLAN, P. J. A performance evaluation of various coatings, substrate materials, and solar collector systems [NASA-TM-X-73355] 13 p0128 N77-15489
- DOLAND, C. Particulate nature of solar absorbing films - Gold black 14 p0163 A77-22982
- DOLGININ, B. A. Concrete placing techniques used during the construction of the kasnoyarsk hydroelectric power plant [AD-A026967] 13 p0121 N77-14528
- DOLINSKII, I. L. The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility 15 p0327 A77-39540
- Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the U02 facility MHD generator 15 p0329 A77-39554
- DOLLEZHAL, M. A. The principles of system studies in nuclear energy research 14 p0157 A77-22342
- Role of the nuclear energy system in the total fuel-energy picture in the USSR 15 p0267 A77-32220
- DOLODARENKO, V. A. The application of linear programming methods to the problem of choosing required reserves of energy for controlled plants 14 p0196 A77-28255
- DOLSON, R. C. A simplified technique for determining the boundary layer voltage loss in MHD generators 16 p0416 A77-42897
- DONAHN, H. The DUO bus, a suburban bus with electric drive, supplied either from overhead wire or from battery 14 p0161 A77-22913
- DONAKOWSKI, T. Wind-powered hydrogen electric systems for farm and rural use [PB-259318/4] 14 p0226 N77-19667
- DONAKOWSKI, T. D. Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0171 A77-23720
- Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344
- Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0237 N77-21558
- DONALDSON, B. Particle Accelerator Conference: Accelerator Engineering and Technology, Chicago, Ill., March 16-18, 1977, Proceedings 15 p0334 A77-39742
- DONAT, G. Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593
- DOWREGAN, T. A. Energy recovery from solid waste using the Union Carbide Purox system 15 p0292 A77-35159

- DONNAN, R. E.**  
Experimental data and theoretical analysis of an  
operating 100 kW wind turbine 16 p0467 A77-48898
- DONNELLY, R. G.**  
Methanol as an automotive fuel: A summary of  
research in the M.I.T. Energy Laboratory  
[PB-262980/6] 15 p0356 N77-23619
- DONOVAN, L. E.**  
Space heating systems new and conventional in the  
Northwest with emphasis on alternate energy  
adaptations 13 p0028 A77-12736
- DOOLEY, J. L.**  
Underground storage of off-peak power  
13 p0027 A77-12728
- DOOLEY, N. T.**  
Gaseous electrode development at RMC  
15 p0325 A77-39530
- DORFMAN, H. H.**  
Geology and potential uses of the geopressure  
resources of the Gulf Coast  
[UCID-17163] 14 p0215 N77-18562
- DORRAN, J.**  
High-efficiency solar concentrator  
13 p0083 N77-10104
- DORN, D. W.**  
Hawaii technology utilization experiment  
[UCID-17343] 15 p0398 N77-28038
- DORNER, S.**  
Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process 15 p0276 A77-33350
- Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process 14 p0238 N77-21582
- DOSAJ, V. D.**  
Solar silicon via improved and expanded  
metallurgical silicon technology  
[NASA-CR-153415] 16 p0528 N77-30606
- DOSS, E. D.**  
Consideration of three-dimensional effects in MHD  
power generators 14 p0142 A77-21261
- Subsonic MHD-diffuser performance with high blockage  
15 p0331 A77-39567
- DOUGLAS, J. G.**  
Geothermal water and gas: Collected methods for  
sampling and analysis: Comment issue  
[BNWL-2094] 14 p0249 N77-21679
- DOUGLAS, R. W.**  
Synthetic natural gas from animal wastes by  
anaerobic fermentation 15 p0314 A77-37660
- DOWLING, R. H.**  
Drag reduction in cocurrent horizontal natural  
gas-hexane pipe flow 16 p0519 N77-29441
- DOWNEY, P.**  
Space: A resource for earth - An AIAA review  
15 p0269 A77-32440
- DOWNING, C. G. E.**  
Recent Canadian activities in biomass  
16 p0470 A77-48917
- DOYLE, L. J.**  
Black magnetic spherule fallout in the eastern  
Gulf of Mexico 13 p0052 A77-14890
- DOYLE, T. J.**  
Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361
- DOYLE, W. T.**  
Proceedings of a Symposium on Offshore Oil  
Potential and Related Land Use Impacts in the  
Central California Coastal Zone  
[PB-259074/3] 14 p0215 N77-18547
- DRAFFIN, C. W.**  
Economic evaluation by ERDA of alternative fossil  
energy technologies 15 p0300 A77-36328
- DRAKE, E.**  
The importation of liquefied natural gas  
14 p0194 A77-27607
- DRESNER, L. E.**  
Design of minimum-weight diffusion batteries  
[PB-266217/9] 16 p0518 N77-28645
- DRESNER, J.**  
Photoelectronic properties of CdTe-electrolyte  
heterojunctions - Feasibility as solar energy  
converters 15 p0320 A77-38330
- DRESSLER, W. E.**  
Transpiration heat transfer in thermal energy  
storage devices 16 p0554 N77-33616
- [PB-267281/4]
- DREWES, D. E.**  
Precipitation scavenging of fossil-fuel effluents  
[PB-256649/5] 13 p0124 N77-14630
- DREXLER, K. E.**  
Vapor-phase fabrication of massive structures in  
space  
[AIAA PAPER 77-542] 15 p0270 A77-32597
- Deep space material sources 15 p0295 A77-35805
- On the feasibility of small power satellites  
15 p0298 A77-36264
- DREYER, J.**  
Cooling with solar energy 15 p0268 A77-32401
- A solar generator 15 p0268 A77-32403
- DREYFUSS, R. E.**  
Reactions in the ZnSe thermochemical cycle for  
hydrogen production 14 p0178 A77-24854
- DRIGA, M. D.**  
The design, fabrication and testing of a five  
megajoule monopolar motor-generation  
15 p0299 A77-36311
- DRINKARD, G.**  
Soluble-salt processes for in-situ recovery of  
hydrocarbons from oil shale 16 p0441 A77-48472
- DRISSEL, G. H.**  
Economics of ethylene production via pyrolysis of  
coal based Fischer-Tropsch hydrocarbons  
15 p0301 A77-36339
- DRIVER, P. E.**  
A new Chrome Black selective absorbing surface  
16 p0406 A77-41585
- DROPPA, J. G.**  
Measurement of dry deposition of fossil fuel plant  
pollutants  
[PB-264495/3] 15 p0376 N77-25685
- DRUCKER, E. E.**  
Thermal simulation of a building with solar  
assisted closed liquid loop unitary heat pumps  
[ASME PAPER 76-WA/SOL-23] 14 p0190 A77-26528
- Commercial building unitary heat pump system with  
solar heating  
[PB-255488/9] 13 p0099 N77-11551
- DRUMMOND, J. E.**  
Miniature solar-electric power system  
16 p0462 A77-48848
- Optimizing a low cost satellite energy system  
16 p0465 A77-48877
- DRYSDALE, P. R.**  
Energetics of the United States of America: An  
atlas  
[BNL-50501] 16 p0522 N77-29615
- DSOUZA, M. D.**  
A consideration of catalytic effects on Pt-Pt/Rh  
thermocouples in combustion systems involving  
hydrogen as a fuel 14 p0245 N77-21645
- DSOUZA, M. V.**  
A consideration of catalytic effects on Pt-Pt/Rh  
thermocouples in combustion systems involving  
hydrogen as a fuel 15 p0283 A77-33407
- DUBASOV, A. E.**  
Calculation of thermal stresses in ceramic  
elements of the refractory channel walls of a  
magnetohydrodynamic generator 15 p0263 A77-31540
- DUBEY, M.**  
The high potential of wind as an energy source  
14 p0183 A77-26084
- Conversion and storage of wind energy as  
nitrogenous fertilizer 16 p0450 A77-48762
- DUBIN, A. P.**  
Effects of selected R&D options on fuel usage in  
the commercial air system 14 p0201 A77-29472

- DUBIN, P.  
Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552
- DUBIN, P. S.  
New energy conservation ideas for existing and new buildings [CONF-75C942-2] 15 p0382 N77-26660
- DUBROVSKII, L. A.  
Contribution to procedures for testing Silazan resin coatings 16 p0443 A77-48522
- DUBSKY, W.  
Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096
- DUCAO, A. S.  
Development of a jet pump-assisted arterial heat pipe [NASA-CR-152015] 16 p0527 N77-30415
- DUCKWORTH, W. B.  
Analysis of ceramic materials for impact members in isotopic heat sources [BNI-X-670] 14 p0210 N77-17246  
Experimental screening of carbon-base materials for impact members in isotopic heat sources [BNI-X-673] 15 p0396 N77-27901
- DUCKETT, C.-G.  
Environmental aspects of energy conversion and use 13 p0006 A77-11044
- DUDA, J. L.  
Economic and social impact of solar powered transportation systems 13 p0079 A77-19120
- DUDKIN, L. D.  
Energy output and service life characteristics of high-voltage low-temperature thermopiles 16 p0442 A77-48517
- DUDKO, I. A.  
Standard-size facets for the reflecting surface of a solar concentrator 13 p0063 A77-17557
- DUFF, W. S.  
Solar thermal electric power systems - Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14] 14 p0186 A77-26474  
Optical and thermal performance analysis of three line focus collectors [ASME PAPER 76-WA/HT-15] 14 p0186 A77-26475  
Solar thermal electric power systems - Comparison of line focus collectors 16 p0483 A77-49032
- DUFFIE, J. A.  
Solar heating and cooling 14 p0156 A77-22025  
Solar heating in the United States [ASME PAPER 76-WA/SOL-8] 14 p0188 A77-26513  
Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587  
Simulation study of several solar heating systems with offpeak auxiliary 16 p0479 A77-49001  
A design procedure for solar air heating systems 16 p0480 A77-49006  
A parametric study of critical fuel costs for solar heating in North America 16 p0493 A77-49118  
A design procedure for solar air heating systems 16 p0501 A77-50209  
Parametric study of critical fuel costs for solar heating in North America [CONF-760842-12] 15 p0392 N77-27533  
Simulation study of several solar heating systems with offpeak auxiliary [CONF-760842-13] 15 p0393 N77-27534  
Review of solar cooling [CONF-760842-9] 15 p0393 N77-27535  
Design procedure for solar air heating systems [CONF-760842-14] 16 p0514 N77-28589
- DUFFIELD, C.  
Geothermal technoeosystems and water cycles in arid lands [PB-263091/1] 15 p0354 N77-23592
- DUFFY, M. A.  
Evaluation of the potential environmental effects of wind energy system development [ERDA/NSF-07378/75/1] 15 p0382 N77-26663  
Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618] 15 p0387 N77-27020
- DUFFY, R.  
An analysis of the feasibility of windmills for power generation in New York State [EPI-TA-17] 15 p0380 N77-26638
- DUFFY, T. E.  
Alternate fuel capability of Rankine cycle engines 13 p0036 A77-12801
- DUGA, J. J.  
Energy: The policy planning framework in state governments. Volume 1: Summary report [PB-254466/6] 13 p0089 N77-10665  
Energy: The policy planning framework in state governments. Volume 2: Appendices [PB-254467/4] 13 p0089 N77-10666
- DUGAN, J. V., JR.  
Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405  
Energy storage possibilities of atomic hydrogen 14 p0245 N77-21643
- DUGGER, G. L.  
Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 15 p0274 A77-33335  
Direct-connect tests of hydrogen-fueled supersonic combustors 16 p0440 A77-48240  
Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018  
Design of low-cost aluminum heat exchangers for OTEC plant-ships 16 p0485 A77-49046  
Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships [PB-255639/7] 13 p0109 N77-12552  
Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report [PB-257444/0] 13 p0116 N77-13554  
Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 14 p0237 N77-21564
- DUGUAY, M. A.  
Lighting with sunlight using sun tracking concentrators 15 p0260 A77-31245  
Solar electricity - The hybrid system approach 16 p0413 A77-42556  
Soft X-ray lasers [SAND-76-5542] 14 p0219 N77-19425
- DUGUNDJI, J.  
Some dynamic problems of rotating windmill systems 13 p0084 N77-10271  
Wind energy conversion [PB-256198/3] 13 p0115 N77-13552  
Wind energy conversion [PB-268718/4] 16 p0559 N77-33667
- DUI, K. Y.  
Silicon solar cells on unidirectionally recrystallized metallurgical silicon 15 p0258 A77-30731  
Silicon solar cells on zone-melted silicon/graphite substrates 16 p0426 A77-45303
- DUISENBAEV, M.  
Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions 16 p0442 A77-48518
- DUKLER, A. B.  
Two-phase flow in geothermal energy sources [TID-27129] 14 p0250 N77-21689
- DULA, A. M.  
Legal and economic prerequisites to space industrialization [IAF PAPER ISL-76-29] 13 p0004 A77-10968
- DULLBA, R. P.  
Molten salt thermal energy storage systems: Salt selection [COO-2888-1] 15 p0365 N77-24609



- DULLIEN, R.  
Relationship of energy growth to economic growth  
under alternative energy policies  
[BNL-50500] 14 p0223 N77-19620
- DUMON, R.  
Solar energy and energy storage 15 p0297 A77-36104
- DUNBAR, P. M.  
Performance limitations of silicon solar cells 15 p0257 A77-30711
- DUNCAN, D. A.  
Research and development of rapid hydrogenation  
for coal conversion to synthetic motor fuels  
(riser cracking of coal)  
[FE-2307-2] 14 p0224 N77-19637
- DUNCAN, R. T.  
Atlanta /Towns/ solar experiment - The lessons we  
learned 13 p0047 A77-13503
- DUNCAN, R. T., JR.  
Lessons learned from Atlanta /towns/ solar  
experiment 16 p0423 A77-44491  
Lessons learned from Atlanta /Towns/ solar  
experiment 16 p0476 A77-48971
- DUNDURS, J.  
Heat extraction from hot dry rock masses  
[PB-256775/8] 13 p0116 N77-13556  
Heat extraction from hot, dry rock masses  
[PB-265116/4] 16 p0516 N77-28609
- DUNKLE, R. V.  
Use of adsorbent beds for energy storage in drying  
of heating systems 16 p0405 A77-41577
- DUNLAY, J.  
A study of implant electric power generation in  
the chemical, petroleum refining, and paper and  
pulp industries  
[PB-255658/7] 13 p0115 N77-13542  
A study of implant electric power generation in  
the chemical, petroleum refining, and paper and  
pulp industries  
[PB-255659/5] 13 p0115 N77-13543
- DUNN, P. D.  
Energy and the developing countries 13 p0006 A77-11043
- DUNN, P. P.  
Sodium-nitrogen liquid-metal MHD facility initial  
test results 15 p0327 A77-39539
- DUNN, W. B.  
Air New Zealand's methods of flying the DC-10  
[AIAA PAPER 77-1255] 16 p0421 A77-44343
- DUNNING, J. S.  
Development of compact lithium/iron disulfide  
electrochemical cells 13 p0026 A77-12715
- DUNTON, A.  
Progress on the Mark VI long-duration MHD generator 14 p0141 A77-21237
- DUPUIS, R. D.  
High-efficiency GaAlAs/GaAs heterostructure solar  
cells grown by metalorganic chemical vapor  
deposition 16 p0408 A77-41741
- DUPUY, C. R. S.  
Improvement of the efficiency of M-S solar cells  
by interfacial modifications 14 p0151 A77-21818
- DURAND, B.  
Periodically adjustable concentrators adapted to  
solar cell panels 13 p0074 A77-19068  
French developments in silicon photovoltaic cells  
14 p0147 A77-21780  
Periodically adjustable concentrators adapted to  
solar cell panels 14 p0166 A77-23385  
Cell and module test procedures seen from the  
manufacturer and the user point of view 16 p0527 N77-30537
- DURNIK, J. D.  
Development of a small, low cost turbojet engine  
with thrust augmentation 16 p0434 A77-47347
- DURRAN, D.  
The chemistry, dispersion, and transport of air  
pollutants emitted from fossil fuel power plants  
in California: Data analysis and emission  
impact model  
[PB-264822/8] 16 p0517 N77-28628
- DUSSEAU, J. B.  
Thermoelectric conversion of solar energy by means  
of refractory Bi4Si compounds 14 p0154 A77-21848
- DUSTIN, H. C.  
Results of baseline tests of the Lucas Limousine  
[NASA-TN-X-73609] 14 p0214 N77-17941
- DUVA, A. B., JR.  
Hydraulic ram effect on composite fuel cell entry  
walls  
[AD-A024832] 13 p0115 N77-13548
- DVERNIKOV, V. S.  
Studies of technological processes by solar energy  
under cosmic simulated conditions  
[IAF PAPER 77-54] 16 p0506 A77-51411
- DWORZAK, W. B.  
Solar Collection Module Test Facility,  
instrumentation fluid loop number one  
[SAND-76-0425] 16 p0535 N77-31619
- DYSON, F. J.  
Can we control the carbon dioxide in the atmosphere  
15 p0322 A77-38674
- DZHAINURZIN, A. A.  
Anomalous current-voltage characteristics observed  
during reactor tests of multielement thermionic  
assemblies 13 p0018 A77-12361
- DEIALO, F. J.  
Investigation of the feasibility of using  
windpower for space heating in colder climates.  
The final design and manufacturing phase of the  
project  
[ERDA/NSP-00603/75/T1] 14 p0215 N77-18561
- DEIOBA, J.  
Energy conservation through residential solar  
retrofit 16 p0479 A77-48994

## E

- EAPEN, T.  
Kinetics of gasification in a combustion pot - A  
comparison of theory and experiment 16 p0440 A77-48176
- EARLEY, D. E.  
Energy and the environment; Proceedings of the  
Third National Conference, Oxford, Ohio,  
September 29-October 1, 1975 15 p0291 A77-35146
- EASTON, C. B.  
Collector field optimization for a solar thermal  
electric power plant 13 p0038 A77-12811  
Collector field design for a central receiver  
solar thermal power plant 16 p0484 A77-49039
- EBERSBACH, K. F.  
Efficient energy utilization 15 p0264 A77-31578
- ECKERT, J. A.  
A multilayer iron-thionine photogalvanic cell  
13 p0007 A77-11108
- ECKERT, E.  
Environmental protection measuring technique.  
Sensor for automatic continuous emission control  
of gases  
[BNFT-PB-T-76-03] 14 p0209 N77-16467
- ECKERT, E. B. G.  
Heat transfer - A review of 1975 literature  
13 p0002 A77-10615
- ECKLUND, E. B.  
Hydrogen storage on highway vehicles - Update '76  
15 p0280 A77-33380  
Hydrogen-via-Electricity - A candidate  
transitional transportation energy system concept  
[AIAA 77-1034] 16 p0405 A77-41570  
Hydrogen storage on highway vehicles: Update 1976  
14 p0242 N77-21614  
Hydrogen-enrichment-concept preliminary evaluation  
[NASA-CR-152814] 15 p0340 N77-22290

- EDELBERG, J.  
Analysis of silicon solar cells with stripe  
geometry junctions 14 p0156 A77-22079
- EDELSTEIN, S. A.  
Field ionization for laser isotope separation  
[EPRI-NF-334] 16 p0552 N77-33512
- EDENBURN, H. W.  
Performance analysis of a cylindrical parabolic  
focusing collector and comparison with  
experimental results 13 p0019 A77-12410  
Optimum operating conditions for a cylindrical  
parabolic focusing collector/Rankine power  
generation cycle system 16 p0468 A77-48905
- EDISKUTY, P. J.  
Hydrogen safety problems 15 p0283 A77-33402  
Hydrogen safety problems 14 p0245 N77-21640
- EDGAR, R. H.  
Lighting with sunlight using sun tracking  
concentrators 15 p0260 A77-31245
- EDGAR, T. F.  
Performance of gas-turbines and combined cycles  
operating on fuels produced by in-situ  
gasification of lignite 16 p0446 A77-48723  
Technical, economic, and environmental evaluation  
of in situ coal gasification 16 p0506 A77-51366
- EDIE, D. D.  
An immiscible fluid - Heat of fusion energy  
storage system 16 p0493 A77-49113
- EDRIS, J. H.  
Flight test development of a helicopter-towed  
surface delivery system 15 p0317 A77-38006
- EDWARDS, D. K.  
Excess liquid in heat-pipe vapor spaces  
[AIAA PAPER 77-748] 15 p0311 A77-37261  
Solar absorption by each element in an  
absorber-coverglass array 16 p0423 A77-44487  
Flight data analysis and further development of  
variable-conductance heat pipes  
[NASA-CR-137953] 13 p0118 N77-14374  
Computer program grade 2 for the design and  
analysis of heat-pipe wicks  
[NASA-CR-137954] 13 p0118 N77-14375  
Transparent glass honeycomb structures for energy  
loss control  
[SAN/1084-75/1] 14 p0248 N77-21673
- EDWARDS, J. L.  
Use of a Lowry-type spatial allocation model in an  
urban transportation energy study 15 p0265 A77-31899
- EDWARDS, J. T.  
Wind energy conversion  
[PB-268718/4] 16 p0559 N77-33667
- EDWARDS, R.  
The production and refining of crude oil into  
military fuels  
[AD-A024652] 13 p0095 N77-11207
- EDWARDS, S. W.  
International energy evaluation system 15 p0319 A77-38216
- EFFENBERGER, R.  
Economic problems concerning the combustion of raw  
lignite 15 p0333 A77-39650
- EFREMOV, B. H.  
Experimental study of accelerating MHD-generator  
jets with supersonic flow distortion 15 p0269 A77-32519
- EGGERS-LURA, A.  
Solar-powered refrigeration by intermittent solid  
absorption systems 13 p0078 A77-19106
- EGGERS, G. H.  
Development status of the fixed mirror solar  
concentrator 16 p0460 A77-48834
- EGGERS, P. E.  
Test and evaluation of the Navy half-watt RTG  
13 p0042 A77-12853
- Spherical radioisotope thermoelectric generators -  
An approach to high specific power devices  
13 p0042 A77-12857  
Terrestrial RTG designs featuring disc-shaped  
thermoelectric modules 16 p0462 A77-48856
- EGIDI, A.  
Some preliminary considerations on photovoltaic  
conversion of solar energy 14 p0164 A77-23299
- EHHALT, D. E.  
Effects of nitrogen fertilizers and combustion on  
the stratospheric ozone layer 15 p0290 A77-34895
- EHRENFELD, J.  
Environmental research needs for coal conversion  
and combustion technologies  
[PB-262159/7] 15 p0347 N77-22659
- EHRENFELDER, H.  
Symposium on the Fundamental Optical Properties of  
Solids Relevant to Solar Energy Conversion  
[PB-256615/6] 13 p0108 N77-12538
- EHRLICH, K. A.  
Socio-economic determinants of a program for lunar  
industrialization in support of space light  
development Lunetta and Soletta  
[IAF PAPER A-77-66] 16 p0507 A77-51533
- EIBSCHUTZ, M.  
Photoelectrolysis with YFeO<sub>3</sub> electrodes  
16 p0399 A77-40553
- EICHELBERGER, J. L.  
Investigation of metal fluoride thermal energy  
storage materials 16 p0451 A77-48767
- EICHLER, J.  
Performance optimization of an air-to-air missile  
design 15 p0289 A77-34298
- EICK, W. K.  
The intermittent jet for supersonic conditions  
increased with passage to operating in a ramjet  
- A low cost engine 15 p0339 N77-22130
- EICKER, P. J.  
Sandia studies for ERDA central receiver thermal  
electric power project 15 p0318 A77-38208
- EINUTIS, E. D.  
A method for evaluating SO<sub>2</sub> abatement strategies  
15 p0293 A77-35169
- EISENHANN, W.  
Balance and optimization procedure for  
thermochemical cycles for hydrogen production  
15 p0276 A77-33345
- EISENBERG, L.  
An application of the economic-environmental power  
dispatch 15 p0317 A77-38121
- EISENBERG, P.  
Improvement of the efficiency of M-S solar cells  
by interfacial modifications 14 p0151 A77-21818
- EISENHARD, E. H.  
A survey of state legislation relating to solar  
energy  
[PB-258235/1] 14 p0213 N77-17600  
Building energy conservation programs: A  
preliminary examination of regulatory activities  
at the state level  
[PB-268873/7] 16 p0559 N77-33673
- EISENHANN, G.  
Energy storage 15 p0264 A77-31579
- EJEBE, G. C.  
Assessment of power system security under load  
uncertainty 13 p0112 N77-13324
- EKCHIAN, A.  
Performance and NO<sub>x</sub> emissions modeling of a jet  
ignition prechamber stratified charge engine  
[SAE PAPER 760161] 13 p0016 A77-12150
- EKDAHL, C. A., JR.  
Atmospheric carbon dioxide variations at the South  
Pole 13 p0067 A77-18439
- EL-BADRY, Y. Z.  
An off-peak energy storage concept for electric  
utilities. I - Electric utility requirements  
16 p0499 A77-49348

- EL-DIPRAWI, A. A.**  
New frontiers in solar and other energy options  
13 p0079 A77-19118
- EL-RABLY, W.**  
Preliminary research on Ocean Energy Industrial Complexes  
16 p0484 A77-49042
- EL-SALAM, E. M. A.**  
Optimum design of a single slope solar still in Riyadh, Saudi Arabia  
16 p0417 A77-42956
- ELDER, J. L.**  
An engineering, geological and hydrological environmental assessment of a 250 MMSCFD dry ashurgi coal gasification facility  
16 p0418 A77-43143
- ELDRIDGE, F. R.**  
Wind machines  
[NSF/EA/N-75-051]  
16 p0529 N77-30620
- ELFERT, E.**  
Energy forecasts yesterday and today  
16 p0400 A77-40683
- ELFWER, P.**  
Reduced drag, paraboloid type, solar energy collectors  
16 p0473 A77-48951
- ELGIN, D. C.**  
Conventional gasification technologies  
15 p0308 A77-36810
- ELIAS, W. Y.**  
An experimental study supported by a computer simulation in a prechamber CFR diesel engine leading to a modified cetane scale for rating low ignition quality fuels  
16 p0525 N77-30259
- ELIASON, J. R.**  
Recommendations for a US geothermal research plan, volume 1  
[PB-261566/4]  
15 p0346 N77-22640  
Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2]  
15 p0346 N77-22641  
Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0]  
15 p0346 N77-22642  
Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8]  
15 p0346 N77-22643
- ELKINS, E. E.**  
Two-phase Hartmann flows in the MHD generator configuration  
[AD-A036452]  
16 p0518 N77-28948
- ELKINS, E. E.**  
Wind-powered hydrogen electric systems for farm and rural use  
[PB-259318/4]  
14 p0226 N77-19667
- ELLINGSON, W. A.**  
Development of nondestructive evaluation methods for coal-conversion systems  
[CONF-760472-2]  
14 p0216 N77-18567
- ELLIOT, D. R.**  
A framework for assessing environmental impacts of possible Antarctic mineral development, part 1  
[PB-262750/3]  
15 p0368 N77-24709
- ELLIOTT, D. G.**  
Comparison of geothermal power conversion cycles  
13 p0030 A77-12750
- ELLIS, A. B.**  
Photoassisted electrolysis of water - Conversion of optical to chemical energy  
13 p0021 A77-12666
- ELLIS, J. P.**  
Transient performance characteristics of a high temperature distributed solar collector field  
13 p0037 A77-12810
- ELLISON, R. D.**  
Savings in energy consumption by residential heat pumps: the effects of lower indoor temperatures and of night setback  
[ORNL-COR-4]  
16 p0529 N77-30628
- ELMS, R. V., JR.**  
SEP solar array technology development  
13 p0040 A77-12825  
Advanced low-mass solar array technology  
[AIAA PAPER 77-888]  
14 p0173 A77-23908  
SEP full-scale wing technology development  
16 p0463 A77-48860
- ELRAHLY, W.**  
Preliminary research on ocean energy industrial complexes, phase 1  
[ORO-4915-3]  
14 p0248 N77-21669
- ELROD, W. C.**  
Development of a small, low cost turbojet engine with thrust augmentation  
16 p0434 A77-47347
- ELSWER, H. B.**  
An assessment of the materials needs for a Kr-85 fuel capsule  
16 p0462 A77-48855
- ELSON, B. M.**  
Space-based solar power study near completion  
16 p0442 A77-48480
- ELSON, R. E.**  
Reactions in the ZnSe thermochemical cycle for hydrogen production  
14 p0178 A77-24854
- ELSTNER, H.**  
Petrochemical basic products from coal - Production of basic and intermediate products for the chemical industry according to the Fischer-Tropsch process  
15 p0267 A77-32247
- ELTINSABY, A. B.**  
A solar heating system simulation model  
15 p0319 A77-38222
- ELZINGA, E. R.**  
Application of the Alstom/Exxon alkaline fuel cell system to utility power generation  
[EPRI-EM-384]  
16 p0557 N77-33643
- EMERSON, L. D.**  
An engine designer's view for advanced secondary power systems  
[AIAA PAPER 77-517]  
14 p0174 A77-23931
- ENGEL, J. E.**  
Survey of technology for storage of thermal energy in heat transfer salt  
[ORNL-TM-5682]  
15 p0392 N77-27513
- ENGEL, R. L.**  
The potential national benefits of geothermal electrical energy production from hydrothermal resources in the West  
13 p0031 A77-12760  
Potential national benefits of geothermal electrical energy production from hydrothermal resources in the West  
[BNWL-SA-5798]  
14 p0220 N77-19583  
Potential benefits of geothermal electrical production from hydrothermal resources  
[BNWL-2001]  
14 p0221 N77-19591
- ENGLE, W. W.**  
Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant  
16 p0461 A77-48842
- ENGLIN, B. A.**  
Effect of nitrogenous bases on the thermal stability of jet fuels  
[NASA-TN-75131]  
15 p0388 N77-27443
- ENINGER, J. E.**  
Excess liquid in heat-pipe vapor spaces  
[AIAA PAPER 77-748]  
15 p0311 A77-37461  
Heat pipe materials compatibility  
[NASA-CR-135069]  
13 p0103 N77-12182  
Flight data analysis and further development of variable-conductance heat pipes  
[NASA-CR-137953]  
13 p0118 N77-14374  
Computer program grade 2 for the design and analysis of heat-pipe wicks  
[NASA-CR-137954]  
13 p0118 N77-14375
- ENOMOTO, Y.**  
Development of a liquid hydrogen car  
15 p0282 A77-33394  
Development of a liquid hydrogen car  
14 p0244 N77-21632
- ENOS, G.**  
Progress on the Mark VI long-duration MHD generator  
14 p0141 A77-21237
- EPIK, I. P.**  
Problems in the use of oil shale as an energy source  
16 p0399 A77-40523
- EPPERLY, W. B.**  
Catalytic coal gasification for SNG production  
13 p0022 A77-12683

- EPSTEIN, M. H.**  
Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618] 15 p0387 N77-27020
- ERDOS, J.**  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization [CONF-760222-P4] 14 p0248 N77-21675
- ERGARDT, E. I.**  
Closed costs of electrical energy for different zones of load graphs of electrical energy systems 16 p0437 A77-47751
- ERICSON, E. B.**  
Transport theory of 3M high-performance thermoelectric materials 13 p0042 A77-12848
- ERISMAN, L. R.**  
Near-term advanced electric vehicle batteries 14 p0161 A77-22909
- ERHOLANVA, G. K.**  
Acoustic properties of subsonic MHD channel 13 p0054 A77-15668
- ERNEST, F. P.**  
High-efficiency thin-film GaAs solar cells [PB-258493/6] 14 p0212 N77-17599
- ERSKINE, W., JR.**  
Redox bulk energy storage system study, volume 1 [NASA-CR-135206-VOL-1] 16 p0553 N77-33608  
Redox bulk energy storage system study, volume 2 [NASA-CR-135206-VOL-2] 16 p0553 N77-33609
- ERVIN, G.**  
Storage of solar energy by inorganic oxide/hydroxides 16 p0492 A77-49109  
Hydration-dehydration cycling of  $\text{MgO} \cdot \text{H}_2\text{O}$  for application to solar heat storage systems [AI-ERDA-13178] 15 p0381 N77-26654  
Experimental test of gas heat transfer system for hydroxide heat storage [AI-ERDA-13176] 15 p0381 N77-26655
- ESBENSEN, T. V.**  
Dimensioning of the solar heating system in the Zero Energy House in Denmark 15 p0256 A77-30319
- ESCHE, M.**  
Flue gas desulfurization experience 14 p0136 A77-20381
- ESCHER, W. J. D.**  
Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0171 A77-23720  
Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344  
Hydrogen-via-Electricity - A candidate transitional transportation energy system concept [AIAA 77-1034] 16 p0405 A77-41570  
Competitively priced hydrogen via high-efficiency nuclear electrolysis 14 p0237 N77-21558  
Hydrogen-via-electricity: A candidate transitional transportation energy system concept [ERDA-77-13] 16 p0514 N77-28596
- ESKENSEN, J. B.**  
Cost and performance comparison of flash binary and steam turbine cycles for the Imperial Valley, California 16 p0455 A77-48801  
Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825
- ESSENHIGH, R. B.**  
Kinetics of gasification in a combustion pot - A comparison of theory and experiment 16 p0440 A77-48176
- ESTES, J.**  
Analysis of information systems for hydropower operations: Executive summary [NASA-CR-149342] 13 p0122 N77-14586  
Analysis of information systems for hydropower operations [NASA-CR-149373] 13 p0129 N77-15497
- ESTES, J. E.**  
Use of Landsat data for the detection of marine oil slicks 15 p0267 A77-32244
- ESTEVE, B.**  
Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593  
Thermodynamics of thermochemical water decomposition processes 14 p0238 N77-21574
- ESTEVE, D.**  
Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815
- ETIEVANT, C.**  
Problems relating to heat storage 14 p0152 A77-21826
- ETTERS, R. D.**  
Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405  
Energy storage possibilities of atomic hydrogen 14 p0245 N77-21643
- EUSTIS, R. H.**  
In-channel observations on coal slag 14 p0139 A77-21222  
MHD systems with low cooling requirements 15 p0332 A77-39515
- EVANS, D. J.**  
Improving regulatory effectiveness in Federal/State siting actions. Alternative financing methods [PB-269390/1] 16 p0547 N77-32606
- EVANS, D. L.**  
Photovoltaic systems using sunlight concentration 13 p0076 A77-19089  
Solar heating and cooling and energy conservation potentials for commercial buildings [ASME PAPER 76-WA/SOL-17] 14 p0189 A77-26522  
Cost studies on terrestrial photovoltaic power systems with sunlight concentration 16 p0405 A77-41579  
On the performance of cylindrical parabolic solar concentrators with flat absorbers 16 p0422 A77-44484  
Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835  
Terrestrial concentrating photovoltaic power system studies 16 p0486 A77-49058
- EVANS, J. C., JR.**  
Solar cell collector and method for producing same [NASA-CASE-LEW-12552-1] 14 p0211 N77-17564  
Method for producing solar energy panels by automation [NASA-CASE-LEW-12541-1] 15 p0344 N77-22615  
Method for fabricating solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 15 p0363 N77-24593
- EVANS, K., JR.**  
Tokamak experimental power reactor [ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- EVANS, R. S.**  
Energy self-sufficiency prospects for the British Columbia forest products industry [VP-X-166] 15 p0363 N77-24591
- EVDOKIMOV, K. V.**  
Experimental research of oscillations in the discharge gap of plasma accelerator [IAP PAPER 77-104] 16 p0507 A77-51431
- EVDOKIMOV, V. M.**  
Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters 16 p0402 A77-41360
- EVENETT, C.**  
International energy evaluation system 15 p0319 A77-38216
- EVSEEV, V. S.**  
Combined cycles in single circuit solar refrigerating systems 15 p0286 A77-33434  
Conjugate cycles of single-loop solar power and refrigeration plants 16 p0427 A77-45541
- EVYUSHENKO, P. L.**  
Combined utilization of nuclear and organic fuels 15 p0272 A77-33159
- SWAN, J.**  
Large-area high-efficiency AlGa/As-GaAs solar cells 15 p0259 A77-30738

- EWELL, G. I.  
Heat pipes for hostile environments in energy  
conservation applications 16 p0450 A77-48758
- EEZARD, H. S., JR.  
A study of the failure of joints in composite  
material fuel cells due to hydraulic ram loading  
[AD-A027258] 13 p0117 N77-14016

## F

- FABRE, E.  
MIS silicon solar cells 13 p0001 A77-10174  
High-efficiency thin silicon solar cells 14 p0148 A77-21786  
Heterostructures for silicon solar cells 14 p0151 A77-21817
- FABRIS, G.  
Liquid-metal MHD - Cycle studies and generator  
experiments 13 p0034 A77-12785  
Investigation of two-phase liquid-metal  
magnetohydrodynamic power systems 13 p0057 A77-16212  
Initial generator tests with revised  
ambient-temperature liquid-metal MHD facility 15 p0326 A77-39538  
Experimental two-phase liquid-metal  
magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 N77-26988
- FACCA, G.  
An update of world geothermal energy development 15 p0286 A77-33524
- FACRY, J. R.  
Variable cycle engines for V/STOL fighters 15 p0339 N77-22117
- FADDOUL, J. R.  
Cost/benefit assessment of the application of  
composite materials to subsonic commercial  
transport engines  
[NASA-TN-X-73557] 13 p0111 N77-13064
- FABRENBURCH, A.  
Applied research on II-VI compound  
[PB-254637/2] 13 p0098 N77-11547
- FABRENBURCH, A. L.  
Photovoltaic properties of n-CdS/p-CdTe  
heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023  
Photovoltaic properties of five II-VI  
heterojunctions 14 p0205 A77-29892  
Photovoltaic energy conversion with n-CdS-p-CdTe  
heterojunctions and other II-VI junctions 15 p0259 A77-30741  
Analysis of the fill factor for n-CdS/p-CdTe solar  
cells 16 p0402 A77-41433
- FAIN, S.  
A study of implant electric power generation in  
the chemical, petroleum refining, and paper and  
pulp industries  
[PB-255658/7] 13 p0115 N77-13542  
A study of implant electric power generation in  
the chemical, petroleum refining, and paper and  
pulp industries  
[PB-255659/5] 13 p0115 N77-13543
- FAIRBANKS, D.  
High level concentration of sunlight on silicon  
solar cells 15 p0267 A77-32208
- FAIRCHILD, B. T.  
Hybrid simulation of fuel cell power conversion  
systems 16 p0414 A77-42636
- FAIRCHILD, C. I.  
Aerosol research and development related to health  
hazards analysis  
[LA-6539-PR] 15 p0385 N77-26703
- FAIZIEV, SH. A.  
Use of transparent heat reflecting coatings in  
solar energy converters 15 p0285 A77-33430  
Utilization of transparent heat-reflecting  
coatings in solar-energy converters 16 p0426 A77-45543
- FAN, J. C. C.  
Wavelength-selective surfaces for solar energy  
utilization 14 p0204 A77-29583  
Selective black absorbers using RF-sputtered  
Cr2O3/Cr cermet films 15 p0265 A77-31951
- FANCELLI, R.  
Locating interesting geothermal areas in the  
Tuscany region /Italy/ by geochemical and  
isotopic methods 13 p0013 A77-11498
- FANTINI, L.  
Study of thermal performance of solar heating  
systems with storage and auxiliary heaters 16 p0417 A77-42957
- FANUCCI, J. B.  
Numerical solution for the unsteady lifting  
characteristics of variable pitch cross-flow  
wind turbines 13 p0044 A77-12871
- FARADAY, B. J.  
Navy applications for terrestrial photovoltaic  
solar power  
[AD-A030529] 14 p0218 N77-18590
- FARAH, O. G.  
Methodology for ranking geothermal reservoirs in  
non-electric industrial applications  
[NTR-7241] 14 p0222 N77-19610
- FARBER, E.  
Transmitter experiment package for the  
communications technology satellite  
[NASA-CR-135035] 15 p0360 N77-24332
- FARBER, E. A.  
Experimental evaluation of the University of  
Florida solar powered ammonia/water absorption  
air conditioning system 13 p0039 A77-12823  
Continuous solar air conditioning with  
ammonia/water absorption cycle 14 p0182 A77-26057  
A comparative study of the effectiveness of  
baseboard convectors versus forced air solar  
heating at the University of Florida Solar House 14 p0182 A77-26058  
A self-contained solar powered tracking device  
[ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477  
Solar energy, its conversion and utilization 15 p0294 A77-35316
- FARBMAN, G. R.  
Nuclear driven water decomposition plant for  
hydrogen production 13 p0035 A77-12791  
Hydrogen production by water decomposition using a  
combined electrolytic-thermochemical cycle 15 p0277 A77-33356  
Development progress on the Sulfur Cycle Water  
Decomposition System 16 p0457 A77-48813  
Hydrogen production by water decomposition using a  
combined electrolytic thermochemical cycle 14 p0238 N77-21589  
Hydrogen generation process  
[FE-2262-3] 16 p0533 N77-31337
- FARCASIU, M.  
Fractionation and structural characterization of  
coal liquids 13 p0069 A77-18582
- FARR, J. S.  
Sources of energy data for Illinois  
[PB-262562/2] 15 p0350 N77-22686
- FASOLO, J.  
Plasma heating systems planned for the Argonne  
experimental power reactor 16 p0407 A77-41712
- FASOLO, J. A.  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- FAUEL, F. L.  
Comparative wind tunnel investigation of sail  
profiles for windmills  
[VTH-191] 13 p0111 N77-13012
- FAZZOLARE, E.  
Feasibility study of a nuclear power-sewage  
treatment system for the conservation and  
reclamation of water resources  
[PB-255630/6] 13 p0126 N77-14960

- FEBER, R. C.**  
Synthetic fuels from solid wastes and solar energy  
15 p0275 A77-33336  
Synthetic fuels from solid wastes and solar energy  
14 p0237 N77-21565
- FEDERS, H.**  
The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich  
15 p0273 A77-33328
- FEDERHANN, R. F.**  
New concepts in solar photovoltaic electric power  
systems design  
13 p0038 A77-12817  
Residential application of photovoltaic energy  
systems  
16 p0497 A77-49155
- FEDOR, O. H.**  
Risk management of liquefied natural gas  
installations  
13 p0002 A77-10451
- FEDOROV, I. I.**  
Heat-pipe regenerator for gas turbine engine  
13 p0020 A77-12528
- FEDOTOWSKY, A.**  
Degradation of solar cell efficiency by sheet  
resistance  
16 p0438 A77-47854
- FEHRTAG, H.**  
The prospect for fusion  
13 p0058 A77-16357
- FEJER, H. E.**  
Assessment application for direct coal combustion  
[PB-263651/2]  
15 p0359 N77-24318
- FELDKIRCHNER, H. L.**  
Hydrocarbon fuels from oil shale  
13 p0023 A77-12692  
Hydrogasification of oil shale  
14 p0169 A77-23556
- FELDMAN, K. T.**  
Heat pipe heat exchanger design considerations  
13 p0031 A77-12765  
Investigation of performance limits in axial  
groove heat pipes  
[NASA-CR-137912]  
13 p0095 N77-11340
- FELDMAN, K. T., JR.**  
Investigation of counterflow shear effects in heat  
pipes  
[AIAA PAPER 77-749]  
15 p0311 A77-37262
- FELDMAN, S.**  
Analysis of LANDSAT B imagery as a tool for  
evaluating, developing, and managing the natural  
resources of New Mexico  
[E77-10090]  
14 p0214 N77-18511
- FELDWICK, R. D.**  
Recent developments of large electrolytic hydrogen  
generators  
15 p0277 A77-33358  
Recent developments of large electrolytic hydrogen  
generators  
14 p0238 N77-21592
- FELIX, F.**  
Higher electric power use reduces energy  
consumption for same gross national product  
13 p0011 A77-11334
- FELT, J. G.**  
Solar shade control - New law for a new technology  
15 p0306 A77-36764
- FELTZ, L. V.**  
Wind tunnel performance data for the Darrieus wind  
turbine with NACA 0012 blades  
[SAND-76-0130]  
14 p0214 N77-18057
- FENSTER, S.**  
Systems analysis of accelerator and storage ring  
systems for inertial fusion  
15 p0334 A77-39744
- FENSTERMACHER, J. E., JR.**  
Progress on the testing of refractories for  
directly-fired MHD air heater service  
14 p0102 A77-21254  
Progress on the testing of refractories for  
directly-fired MHD air heater service. II  
15 p0328 A77-39544
- FENTON, J. W.**  
Vibration characteristics of a large wind turbine  
tower on non-rigid foundations  
[NASP-TM-X-73670]  
15 p0378 N77-26613
- FENYES, S. J.**  
The structure of building specifications  
[PB-257581/9]  
13 p0132 N77-15524
- FERRER, R. R.**  
New concepts in solar photovoltaic electric power  
systems design  
13 p0038 A77-12817  
Silicon solar photovoltaic power stations  
[AIAA 77-1021]  
16 p0404 A77-41563
- FERDEN, S. L.**  
Program document for Energy Systems Optimization  
Program 2 (ESOP2). Volume 1: Engineering manual  
[NASA-CR-151422]  
15 p0372 N77-25631
- FERDMAN, S.**  
Space solar power - An available energy source  
13 p0056 A77-15946
- FERGUSON, F. F.**  
Ecological review of hydroelectric reservoirs in  
Puerto Rico  
[CER-1]  
16 p0540 N77-31673
- FERGUSON, R. E.**  
A site sensitive solar collector evaluator  
16 p0473 A77-48947
- FERNANDES, R. A.**  
Hydrogen cycle peak-shaving on the New York State  
Grid using fuel cells  
14 p0199 A77-29094
- FERRARA, A.**  
Molten salt thermal energy storage for utility  
peaking loads  
16 p0451 A77-48765
- FERRERELL, G. C.**  
Regional energy system for the planning and  
optimization of national scenarios (RESPONS).  
Clean coal energy: Source-to-use economics  
project  
[ERDA-76-109]  
14 p0222 N77-19602
- FERRER, J.**  
The migma high energy advanced fuel direct  
conversion fusion power plant  
13 p0035 A77-12794  
Advanced fuel fusion experimentation with  
Migmacells II and III - Orbit diagnostics and  
lifetime measurements  
16 p0436 A77-47362
- FERRER, J. C.**  
Fusion products detection system in Migmacell II  
16 p0436 A77-47363
- FERRETTI, E. J.**  
Technology and economics of industrial fuel gas  
from coal  
15 p0302 A77-36342  
Coal gasification update  
15 p0306 A77-36763
- FERRIGNO, S.**  
Hydrogen sulfide stress corrosion cracking in  
materials for geothermal power  
[COO-2576-3]  
16 p0519 N77-29269
- FETROVICH, J. G.**  
Studies of biofouling in ocean thermal energy  
conversion plants  
16 p0484 A77-49044
- FETTERMAN, G. P., JR.**  
Selection of driving cycles for electric vehicles  
of the 1990's  
13 p0024 A77-12702
- FEUCHT, D. L.**  
Heterojunctions in photovoltaic devices  
14 p0162 A77-22977  
Efficiency calculations for Al<sub>x</sub>Ga<sub>1-x</sub>As-GaAs  
heterojunction solar cells  
15 p0257 A77-30720
- FERNSTEIN, S.**  
Thermally induced migration of hydrocarbon oil  
15 p0268 A77-32375
- FIATTE, F.**  
Water pumping - A practical application of solar  
energy  
13 p0079 A77-19117
- FICHTENBAUM, R.**  
The feasibility of solar house heating - A study  
in applied economics  
16 p0493 A77-49117
- PICK, T. R.**  
Effect of reservoir temperature decline on  
geothermal power plant design and economics  
16 p0456 A77-48805

- FICKETT, A. P.  
Economic assessment of the utilization of fuel cells in electric utility systems  
[AIAA 77-1012] 16 p0403 A77-41559
- FIELDS, H. H.  
Degasification and production of natural gas from an airshaft in the Pittsburgh coalbed  
[PB-258101/5] 14 p0210 N77-17555
- FILATOV, A. I.  
Economic effectiveness of solar electric power stations  
13 p0063 A77-17556
- FINCH, E. R., JR.  
Energy - Ecospace  
[IAP PAPER ISL-76-59] 13 p0004 A77-10970
- FINCH, F. T.  
Prospects of generating power with laser-driven fusion  
13 p0002 A77-10634
- FINEGOLD, J. G.  
Crash test of a liquid hydrogen automobile  
15 p0282 A77-33397  
Crash test of a liquid hydrogen automobile  
14 p0244 N77-21635
- FINGER, H. B.  
The roles of aerospace organizations in energy development or can aerospace success bring success in energy  
[AIAA PAPER 77-1001] 16 p0408 A77-41855
- PINK, P. T.  
Waste POL disposal through energy recovery  
[AD-A031783] 14 p0235 N77-20957
- FINK, R. J.  
The strategic petroleum reserve and liquefied natural gas supplies  
[PB-265488/7] 16 p0520 N77-29598
- PINKE, R. C.  
NASA electric propulsion program  
[AIAA PAPER 76-1068] 13 p0045 A77-13033
- FINKEN, K. H.  
Schlieren measurements of a high density z-pinch  
13 p0060 A77-16697
- FINNEHORE, E. J.  
Potential land subsidence at geothermal development sites  
15 p0286 A77-33525  
The analysis of subsidence associated with geothermal development. Volume 1: Handbook  
[PB-263692/6] 15 p0369 N77-24714  
The analysis of subsidence associated with geothermal development. Volume 2: Research report  
[PB-263693/4] 15 p0369 N77-24715
- FINUCANE, D.  
Perturbation analysis of second-order effects in kinetics of oil-shale pyrolysis  
13 p0070 A77-18585
- FIRETEARD, V.  
Reduction of the transverse edge effect in linear machines with homogeneous secondary armature by changing the air gap configuration  
15 p0310 A77-36939
- FISCHER-COLBEIN, E.  
Temperature dependence of the photovoltaic performance of Si cells under blue, white, and near-bandgap irradiation  
[UCRL-76203] 15 p0381 N77-26652
- FISCHER, A. K.  
Initial generator tests with revised ambient-temperature liquid-metal MHD facility  
15 p0326 A77-39538
- FISCHER, D. D.  
Environmental impact studies related to underground coal gasification  
[TID-27003] 13 p0100 N77-11573
- FISCHER, H.  
Low-cost solar cells based on large-area unconventional silicon  
15 p0258 A77-30730  
Manufacturing and evaluation of phthalocyanines as catalysts for fuel cells  
[BNFT-FE-T-76-25] 13 p0114 N77-13540  
Heat transportation by hot water pipe-lines at 90 deg C  
[AD-A038301] 16 p0512 N77-28453
- FISCHER, H. C.  
Development of the ice-maker heat pump  
[CONF-760618-2] 14 p0223 N77-19624
- Annual cycle energy system: Initial investigations  
[ORNL-TN-5525] 15 p0364 N77-24599  
Application of the ice-maker heat pump to an annual cycle energy system  
[CONF-761107-13] 15 p0382 N77-26659
- FISCHER, J. R.  
Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier  
[PB-268106/2] 16 p0543 N77-32295
- FISCHER, W.  
Development of sodium/sulfur-cells  
13 p0026 A77-12716  
Some studies on sodium/sulfur cells  
13 p0055 A77-15813
- FISH, L. W.  
The use of mixture working fluids in geothermal binary power cycles  
16 p0455 A77-48802  
Sensitivity analysis for OTEC propane and mixture cycles  
16 p0485 A77-49047  
Resource utilization efficiency improvement of geothermal binary cycles, phase 1  
[ORO-4944-3] 13 p0123 N77-14600
- FISHELSON, G.  
Air pollution and the siting of fossil fuel power plants  
[ANL-76-XX-14] 15 p0386 N77-26708
- FISHER, P. D.  
Application study of wind power technology to the city of Hart, Michigan  
[COO-2603-1] 14 p0212 N77-17582
- FISHER, R. A.  
Factors influencing the economics of large-scale in situ coal gasification operations  
15 p0306 A77-36765
- FISHER, T. F.  
The PUROX System  
15 p0315 A77-37671
- FISHMAN, M.  
The potential for reusable homogeneous containers  
[PB-265100/8] 16 p0518 N77-29007
- FITCH, R. A.  
A half megawatt Pulse Forming Network (PFN)  
[AD-A039709] 16 p0526 N77-30373
- FITZGERALD, L. D.  
The financial incentives for the fabrication of improved absorption coatings for the flat plate collector  
16 p0487 A77-49066
- FITZPATRICK, G. O.  
Thermionic topping for central station power plants  
13 p0034 A77-12787  
Increased central station power plant efficiency with a thermionic topping system  
16 p0467 A77-48894
- FLANAGAN, R. C.  
Flywheel hybrid power trains. I - Component and drive selection. II - Numerical optimization and operation  
16 p0438 A77-47968
- FLECHOW, J.  
Thermostatics and thermokinetics of a flat plate solar collector with constant heat capacity  
13 p0073 A77-19057
- FLEISCHMAN, G. L.  
Heat pipe materials compatibility  
[NASA-CR-135069] 13 p0103 N77-12182
- FLEMING, W. S.  
Commercial building unitary heat pump system with solar heating  
[PB-255488/9] 13 p0099 N77-11551
- FLETCHER, R. A.  
Hydrogen and oxygen from water  
16 p0430 A77-46573
- FLETCHER, J.  
Evaluation of wind-energy sites from aeolian geomorphologic features mapped from LANDSAT imagery. First results  
[ERDA/NSF-00598/75/T1] 14 p0218 N77-18667
- FLIEGE, H. B.  
Environmental protection measuring technique. Sensor for automatic continuous emission control of gases  
[BNFT-FE-T-76-03] 14 p0209 N77-16467
- FLORSCHUTZ, L. W.  
Cost studies on terrestrial photovoltaic power systems with sunlight concentration  
16 p0405 A77-41579

- Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835
- Extension of the Hottel-Whillier-Bliss model to the analysis of combined photovoltaic/thermal flat plate collectors 16 p0486 A77-49057
- Terrestrial concentrating photovoltaic system studies 16 p0486 A77-49058
- FLOYD, E. L.  
Borehole hydraulic coal mining system analysis [NASA-CR-154119] 16 p0512 N77-28558
- FORELL, W. K.  
The Wisconsin Regional Energy project - An applied systems analysis approach to regional energy/environment modeling 15 p0309 A77-36825
- FOLEY, G. J.  
The EPA role in energy research and development 15 p0291 A77-35148
- FOLEY, R. T.  
Improved acid electrolytes for the hydrocarbon-air fuel cell 14 p0195 A77-28166
- Research on electrochemical energy conversion systems [AD-A023689] 13 p0090 N77-10681
- Research on electrochemical energy conversion systems [AD-A034454] 15 p0367 N77-24632
- FOLKNER, C. A., JR.  
Solar Collection Module Test Facility, instrumentation fluid loop number one [SAND-76-0425] 16 p0535 N77-31619
- FONASH, S. J.  
Improvement of the efficiency of M-S solar cells by interfacial modifications 14 p0151 A77-21818
- FORNER, S.  
Large-scale applications of superconductivity 16 p0412 A77-42475
- FORBES, E. B.  
Geothermal Energy and Wind Power: Alternate energy sources for Alaska [PB-261521/9] 15 p0349 N77-22678
- FORD, A.  
Summary description of the ROOM1 model [LA-6424-HS] 15 p0369 N77-25010
- Methodology for the analysis of the impacts of electric power production in the West [LA-6720-PR] 16 p0533 N77-31428
- FOREMAN, K. B.  
Fluid dynamics of diffuser augmented wind turbines 16 p0467 A77-48899
- Diffuser augmentation of wind turbines 16 p0490 A77-49093
- Diffuser augmentation of wind turbines [CONF-760842-6] 16 p0521 N77-29610
- FORESTIERI, A. E.  
ERDA/Lewis research center photovoltaic systems test facility [NASA-TM-X-73641] 15 p0343 N77-22609
- FORESTIERI, A. F.  
Photovoltaic test and demonstration project 14 p0153 A77-21838
- Status of the ERDA/NASA photovoltaic tests and applications project [NASA-TM-X-73567] 13 p0114 N77-13537
- Solar cell shingle [NASA-CASE-LEW-12587-1] 16 p0534 N77-31601
- FORREST, J.  
Further studies on the oxidation of sulfur dioxide in coal-fired power plant plumes 15 p0333 A77-39657
- Oxidation of sulfur dioxide in power plant plumes [BNL-21698] 15 p0386 N77-26713
- FORRESTER, B. C., III  
Recovery of inaccessible coal reserves by in situ gasification 13 p0022 A77-12686
- Recovery of inaccessible coal reserves by in situ gasification [CONF-760906-5] 14 p0224 N77-19636
- FORSTH, K. C.  
Microcomputer processor for monitoring of solar heated buildings 16 p0481 A77-49015
- FORSTYTH, E. B.  
Brookhaven superconducting cable test facility [BNL-21780] 14 p0236 N77-21331
- PORTAK, R.  
Mathematical simulation and empirical determination of the aerochemical and thermal atmospheric pollution resulting from energy conversion processes [DLR-IB-553-75/1] 13 p0091 N77-10700
- Comparison of calculated and measured maximum aboveground air pollutant concentrations and their respective distances from the source of release of large power plants [ORNL-TR-4231] 15 p0386 N77-26712
- PORTESCUE, F.  
Comparative breeding characteristics of fusion and fast reactors 15 p0297 A77-36124
- PORTIN, M.  
An experimental 200 kW vertical axis wind turbine for the Magdalen Islands 13 p0044 A77-12874
- POSDICK, R. J.  
The electric vehicle 15 p0307 A77-36798
- POSS, A. S.  
Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- FOSSARD, A. J.  
Linear model of a dissipative PWM shunt regulator 13 p0080 A77-19172
- FOSSUM, J. F.  
Silicon solar cell development for concentrated-sunlight, high-temperature applications [SAND-76-5311] 15 p0380 N77-26647
- FOSSUM, J. G.  
Performance of n+/p silicon solar cells in concentrated sunlight 15 p0258 A77-30729
- POSTER, H. D.  
Daedalo-phobia - Diagnosis and prognosis 16 p0494 A77-49121
- POSTER, J. F.  
Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere [PB-253375/0] 13 p0092 N77-10715
- POSTER, J. S., JR.  
Energy - An emerging role for aerospace 14 p0166 A77-23363
- POSTER, W. H.  
Homeowner's guide to solar heating and cooling 13 p0062 A77-17525
- POTE, A. A.  
Thermally induced migration of hydrocarbon oil 15 p0268 A77-32375
- FOURAKIS, E.  
Low-profile heliostat design for solar central receiver systems 16 p0422 A77-44480
- Conceptual design of an open cycle gas turbine solar central receiver system 16 p0481 A77-49022
- FOURAKIS, E. M.  
Conceptual heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility at Sandia, Albuquerque 15 p0318 A77-38209
- Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility 16 p0484 A77-49040
- FOURNIER, J.  
Effect of the characteristics of electrical supply networks on the design of solar power plants 14 p0155 A77-21858
- FOULER, C. F.  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-261910/4] 15 p0350 N77-22688
- Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-267937/1] 16 p0554 N77-33619
- FOX, G. R.  
Future trends in electrical energy generation economics in the United States 15 p0317 A77-37960



- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary [NASA-CR-134949-VOL-1] 15 p0379 N77-26631
- FOX, R. J.  
A solar/Stirling total energy system 16 p0481 A77-49021
- FRABETTI, A. J., JR.  
The development of net energy estimates for extraction, handling, and processing of selected fuels 15 p0291 A77-35147
- FRANCE, P. W.  
A comparison between experimental and numerical investigations of the motion of the water surface in a model surge tank 16 p0505 A77-51257
- FRANCIA, J.  
Clean air protection and industrial development 13 p0010 A77-11303
- FRANCIS, E. J.  
Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 15 p0274 A77-33335  
Technical and economic feasibility of Ocean Thermal Energy Conversion 16 p0481 A77-49018  
Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships [PB-255639/7] 13 p0109 N77-12552  
Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report [PB-257444/0] 13 p0116 N77-13554  
Design of an ocean thermal energy plant ship to produce ammonia via hydrogen 14 p0237 N77-21564
- FRANCIS, R. W.  
Ambient temperature electric vehicle batteries based on lithium and titanium disulfide 13 p0025 A77-12706
- FRANKEN, J. C.  
Heat transfer problems in flat plate collectors 14 p0202 A77-29570
- FRANK, A. A.  
The fuel efficiency potential of a flywheel hybrid vehicle for urban driving 13 p0020 A77-12664  
Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705  
Increased fuel economy in transportation systems by use of energy management: Second year's program. Executive summary [PB-256117/3] 13 p0108 N77-12536  
Increased fuel economy in transportation systems by use of energy management - second year's program [PB-257177/6] 13 p0133 N77-15930
- FRANK, H. A.  
Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045] 16 p0546 N77-32593
- FRANK, R. I.  
New analysis of a high-voltage vertical multijunction solar cell 13 p0069 A77-18490
- FRANK, T. G.  
Prospects of generating power with laser-driven fusion 13 p0002 A77-10634  
Heat transfer problems associated with laser fusion 13 p0068 A77-18441  
Technology assessment of laser-fusion power production [LA-UR-76-2060] 15 p0351 N77-22975
- FRANK, F. H.  
Gasification of Rhenish brown coal as mined 14 p0175 A77-24213
- FRANK, H.  
Non-nuclear energy technology. Low temperature cable for power transmission [BNFT-PE-T-76-01] 14 p0210 N77-17372
- FRANKENFELD, J. W.  
Development of high stability fuel. Executive summary [AD-A039977] 16 p0533 N77-31339
- FRANKLIN, A. D.  
The electron factor in catalysis on metals electrocatalysis on non-metallic surfaces [PB-256264/3] 13 p0103 N77-12166
- FRANKOSKY, J. O.  
A summary of the DARPA energy and materials shortages programs, fiscal years 1972-1976 [AD-A036021] 15 p0375 N77-25671
- FRANTSEVICH, I. W.  
Studies of technological processes by solar energy under cosmic simulated conditions [IAF PAPER 77-54] 16 p0506 A77-51411
- FRANZ, S. L.  
Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells 15 p0259 A77-30736
- FRANZEN, J. E.  
Considerations on coal gasification 15 p0266 A77-32169
- FRASER, M. D.  
Solar SNG - Large-scale production of SNG by anaerobic digestion of specially grown plant matter 13 p0021 A77-12671  
Design, operation and economics of the energy plantation 15 p0315 A77-37667  
The photosynthesis energy factory - Analysis, synthesis, and demonstration 16 p0449 A77-48753  
Survey of the applications of solar thermal energy to industrial process heat 16 p0481 A77-49019  
Design, operation and economics of the Energy Plantation 16 p0497 A77-49154
- FRAZIER, M. A.  
Production and processing of US tar sands: An environmental assessment [PB-266266/6] 16 p0513 N77-28575
- FREDERICK, M. V.  
Magnetic suspension densimeter for measurements on fluids of cryogenic interest 13 p0007 A77-11093
- FREDERICKING, T. H. K.  
Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids 16 p0411 A77-42160
- FREEMAN, T. L.  
Compatible building design 16 p0423 A77-44497  
Simulation study of solar heat pump systems 16 p0477 A77-48982
- FREIDBERG, J. P.  
Review of toroidal theta-pinch theory 16 p0427 A77-45628
- FREIN, J. B.  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply 14 p0179 A77-25224  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply [PB-263761/9] 15 p0367 N77-24635
- FRIEWALD, D. A.  
Prospects of generating power with laser-driven fusion 13 p0002 A77-10634
- FRENCH, R. P.  
Deterministic insolation estimates for solar total energy systems 16 p0462 A77-48847
- FRENCH, M. J.  
Hydrodynamic basis of wave-energy converters of channel form 15 p0267 A77-32211
- FRESTREPO, P.  
On black solar cells or the tetrahedral texturing of a silicon surface 13 p0004 A77-11000
- FRETTER, R. P.  
Electrofluid dynamics energy conversion research [AD-A029066] 14 p0218 N77-18593  
Fluid dynamic energy conversion and transfer processes [AD-A040589] 16 p0533 N77-31444

- FREY, K.  
Solar heating projects at the Institute for  
Environmental Research 13 p0079 A77-19119
- FRICKEL, R. E.  
Infrared extinction spectra of some common liquid  
aerosols 15 p0290 A77-34561
- FRIEDMAN, D.  
Light commercial Brayton/Rankine space  
conditioning system 16 p0445 A77-48716
- FRIEDMAN, J. D.  
Geothermal flux through palagonitized tephra,  
Surtsey, Iceland - The Surtsey  
temperature-data-relay experiment via Landsat-1  
13 p0048 A77-13648
- FRIEDMAN, H.  
Domestic and world trends (1980 - 2000) affecting  
the future of aviation  
[NASA-CR-144838] 13 p0126 N77-14981
- FRIEDMAN, S.  
Chemical cleaning of coal  
[ASME PAPER 76-WA/APC-2] 14 p0184 A77-26409  
Economic feasibility of the conversion of organic  
waste to fuel oil and pipeline gas 15 p0302 A77-36346
- FRIEFELD, J. E.  
A central receiver solar system applicable to  
central power stations 16 p0483 A77-49036
- FRIED, H. J.  
Energy equivalents for current and prospective  
automotive fuels in Canada  
[AD-A026195] 13 p0124 N77-14609
- FRITZSCHE, A.  
Development of a vertical axis wind turbine (phase  
1)  
[BNFT-PP-T-76-55] 14 p0209 N77-17112
- FROMHERT, H.  
Energy in the household - Comparison of heating  
costs and prognosis concerning the consumption  
of energy until 1985 13 p0015 A77-12059
- FROMHOLZER, J.  
Water power in the immediate future 13 p0056 A77-15850
- FROST, C. H.  
Characteristics of synthetic crude from crude  
shale oil produced by in situ combustion retorting  
14 p0169 A77-23552  
Production of synthetic crude from crude shale oil  
produced by in situ combustion retorting  
14 p0169 A77-23557
- FRUCHTER, J. S.  
Mercury emissions from geothermal power plants  
15 p0289 A77-34428  
Characterization of substances in products  
effluents and wastes from synthetic fuel  
production tests  
[BNWL-2131] 16 p0540 N77-31675
- FU, Y. C.  
Catalytic coal liquefaction using synthesis gas  
13 p0059 A77-16473
- FUCHS, K.  
The significance of nuclear energy for satisfying  
future energy requirements 15 p0333 A77-39649
- FUEBISCH, H.  
The turbo-generator with superconducting field  
winding in transient operation  
[BLL-BTS-10351] 15 p0360 N77-24381
- FUESLE, R. W.  
Water and energy systems - A planning model  
16 p0506 A77-51279  
Mathematical models for use in planning regional  
water resources and energy systems  
[PB-261364/4] 15 p0352 N77-23022
- FUES, A. E.  
Aerodynamic design of a conventional windmill  
using numerical optimization 14 p0199 A77-29070
- FUJIMURA, H.  
Photocell using covalently-bound dyes on  
semiconductor surfaces 16 p0412 A77-42412
- FUJII, K.  
The calcium-iodine cycle for the thermochemical  
decomposition of water 15 p0275 A77-33340
- FUJITA, T.  
Benefits of hydrogen production research  
13 p0032 A77-12768  
Hydrogen use projections and supply options  
15 p0285 A77-33418  
Hydrogen use projections and supply options  
14 p0247 N77-21658
- FUKUDA, K.  
A study on solar tower power system 14 p0152 A77-21832
- FUKUDA, O.  
Liquid fluidized bed heat exchanger - Horizontal  
configuration experiments and data correlations  
16 p0455 A77-48799
- FUKUNAGA, P. S.  
Working fluid selection and preliminary heat  
exchanger design for a Rankine cycle geothermal  
power plant  
[PB-261564/9] 15 p0349 N77-22684
- FULLER, L. C.  
Summary report: An exploratory study of cost  
targets for solar electric power plants  
[ORNL-TM-5787] 16 p0538 N77-31654
- FULLER, R. E.  
Geothermal down-well pumping system  
[PB-261857/7] 14 p0252 N77-21732
- FULOP, J.  
The shaping of our needs in mineral raw materials  
and sources for meeting those needs 13 p0017 A77-12246
- FUNK, H.  
A supplementary fuel for power generation /Ames,  
Iowa/ 16 p0433 A77-47214
- FUNK, J.  
A thermochemical data bank for cycle analysis  
15 p0276 A77-33346
- FUNK, J. E.  
Stage efficiency in the analysis of thermochemical  
water decomposition processes 13 p0047 A77-13538  
Hydrogen production via thermochemical cycles  
based on sulfur chemistry 13 p0048 A77-13541  
Entropy production, efficiency, and economy in the  
case of the thermochemical production of  
synthetic fuels - The sulfuric acid-hybrid  
process for thermochemical water decomposition  
14 p0145 A77-21544  
Thermodynamic analysis of alternate energy  
carriers, hydrogen and chemical heat pipes  
15 p0279 A77-33374  
Irreversibilities, heat penalties, and economics  
for the methanol/sulfuric acid process  
16 p0457 A77-48814  
A thermochemical data bank for cycle analysis  
14 p0238 N77-21578  
Thermodynamic analysis of alternate energy  
carriers, hydrogen and chemical heat pipes  
14 p0240 N77-21608  
Technoeconomic analysis of large scale  
thermonuclear production of hydrogen  
[EPRI-EH-287] 16 p0532 N77-31336
- FUNKH, H. F.  
Research and development assessment on safety and  
pollution control for outer continental shelf  
operations  
[AD-A034727] 15 p0357 N77-23635
- FURBY, R. L.  
Exhaust and evaporative emission from a Brazilian  
Chevrolet fueled with ethanol-gasoline blends  
16 p0444 A77-48708
- FURLANI, D. E.  
Batch autoclave studies of catalytic  
hydrosulfurization of coal 14 p0145 A77-21617
- FURUHANA, S.  
Development of a liquid hydrogen car  
15 p0282 A77-33394  
Development of a liquid hydrogen car  
14 p0244 N77-21632
- FURUMOTO, A. S.  
A coordinated exploration program for geothermal  
sources on the island of Hawaii  
[PB-261691/0] 15 p0350 N77-22685

The Hawaii geothermal project, initial phase 2  
progress report  
[PB-263120/8] 15 p0355 N77-23594

## G

GADDY, E. H.  
Results from the IMP-J violet solar cell  
experiment and violet cell balloon flights  
[NASA-TN-D-8393] 13 p0128 N77-15491

GADDY, J. L.  
Solar energy collection by bioconversion  
13 p0021 A77-12672  
Toward establishing a national energy policy  
15 p0307 A77-36767

GAEDKE, M.  
High-speed flywheels as possible energy storage  
devices in the future  
13 p0056 A77-15856

GAFFNEY, G. P.  
The NASA Energy Conservation Program  
[AIAA PAPER 77-1005] 16 p0405 A77-41571

GAPUROV, A. H.  
Solar heating in residential houses in Uzbekistan  
15 p0316 A77-37774  
Residential solar heating in Uzbekistan  
16 p0437 A77-47430

GAHMER, J.  
Experimental demonstration of an iron chloride  
thermochemical cycle for hydrogen production  
13 p0032 A77-12772

GAHN, R. P.  
The Redox flow system for solar photovoltaic  
energy storage  
[NASA-TN-X-73562] 13 p0106 N77-12522

GAIDELIS, J. A.  
A 100-kW metal wind turbine blade basic data,  
loads and stress analysis  
[NASA-CR-134956] 14 p0236 N77-21467

GAINES, G. B.  
Review of world experience and properties of  
materials for encapsulation of terrestrial  
photovoltaic arrays  
[NASA-CR-149451] 13 p0106 N77-12524

GAINES, L. H.  
Ambient temperature electric vehicle batteries  
based on lithium and titanium disulfide  
13 p0025 A77-12706

GAJEWSKI, B.  
A cylindrical blackbody solar energy receiver  
13 p0018 A77-12404

GAL, D.  
Mathematical method for determining reaction  
networks in chemical systems  
16 p0418 A77-43093

GALAKTIONOV, IU. I.  
Idealization of complex dynamic systems with  
examples involving electrical energy systems  
16 p0434 A77-47331

GALBRAITH, A. D.  
The lithium-water-air battery for automotive  
propulsion  
14 p0162 A77-22915

GALESKI, J. B.  
Performance of emission control devices on boilers  
firing municipal solid waste and oil  
[PB-257136/2] 13 p0133 N77-15550

GALKIN, L. B.  
Automatic optimization of operating modes in  
thermionic electrical power generators  
[IAF PAPER 77-142] 16 p0507 A77-51445

GALL, R. L.  
Fluidized-bed combustion of anthracite refuse  
16 p0454 A77-48793

GALLAGHER, J. H.  
The Energy Supply Planning Model - A working tool  
for regional analysis of alternative national  
energy policies  
15 p0319 A77-38221

GALLAGHER, J. P.  
Synthesis and analysis of jet fuel from shale oil  
and coal syn-crudes  
[NASA-CR-135112] 13 p0103 N77-12230

GALLAGHER, J. T.  
Political and economic justification for immediate  
realization of a syn fuels industry  
14 p0191 A77-27276

GALLAGHER, T. F.  
Field ionization for laser isotope separation  
[EPRI-NEP-334] 16 p0552 N77-33512

GALLEY, P.  
Effect of optical properties of a surface exposed  
to solar radiation on the radiation balance  
13 p0052 A77-14928

Study of emittance distribution along the walls of  
a cellular low-loss cell in the case of a base  
surface with arbitrary emission indicatrix  
13 p0069 A77-18495

Contribution to the study of solar energy  
collectors - Selective plates and cells  
13 p0072 A77-19051

Antiloss cell structures - Coupling with a  
selective surface  
14 p0148 A77-21790

Antiloss cellular structures - The effect of the  
material cutoff wavelength  
14 p0148 A77-21791

GALOWIN, L. S.  
A central solar energy utilization system  
13 p0057 A77-16210

GANDEL, M. G.  
Environmental impact of major solar power  
development  
16 p0452 A77-48773

GANDHIDASAN, P.  
The rate of mass transfer in a solar regenerator  
15 p0323 A77-39109

GANGOLI, M.  
Liquid fuels and chemical feedstocks from coal by  
supercritical gas extraction  
16 p0429 A77-46449

GANGULI, R.  
Design and performance studies on a solar room  
heater  
15 p0255 A77-30314

GANNON, R. E.  
Applications of the rapid devolatilization of coal  
in MHD power cycles  
14 p0141 A77-21249

Devolatilization of pulverized coal during rapid  
heating  
15 p0331 A77-39566

Modelling of entrained-bed pulverized coal gasifiers  
16 p0401 A77-41321

Diagnostics for thermal cracking of coal volatiles  
in entrained-bed gasifiers  
[WSS/CI PAPER 76-25] 16 p0419 A77-43593

GANT, R. E.  
MUS systems analysis: Initial comparisons of  
modular-sized integrated utility systems and  
conventional systems  
[ORNL-NUD-MUS-6] 14 p0249 N77-21684

GARBE, Y. M.  
Demonstration of pyrolysis and materials recovery  
in San Diego, California  
14 p0137 A77-20521

GARBER, M.  
Studies of helical conductor models for  
superconducting ac power transmission  
[BNL-21784] 14 p0236 N77-21332

GARCIA, A. P.  
Analysis of the technical and cost feasibility of  
solar and/or wind energy systems for Coast Guard  
public quarters  
[AD-A028332] 14 p0209 N77-16460

GARDNER, L.  
Production of a hydrocarbon-type synthetic fuel  
from wood  
[NRC-15638] 13 p0127 N77-15210

GARDNER, R. A.  
Precision insolation measurement under field  
conditions  
14 p0219 N77-19113

GAREIS, G. E.  
The interaction of batteries and fuel cells with  
electrical distribution systems - Line  
commutated converter interface  
16 p0414 A77-42634

The interaction of batteries and fuel cells with  
electrical distribution systems - Force  
commutated converter interface  
16 p0414 A77-42635

GARP, B.  
Use of solar water-heating installations in the  
combined cycle of a thermal electric power plant  
14 p0152 A77-21825

- GARG, D. P.  
A preliminary assessment of solar energy technology  
[ASME PAPER 76-WA/TS-1] 14 p0190 A77-26531
- GARG, H. P.  
Design and performance studies on a solar room  
heater 15 p0255 A77-30314
- GARG, S. K.  
On pressure-work, viscous dissipation and the  
energy balance relation for geothermal reservoirs  
16 p0505 A77-51256  
Geohydrological environmental effects of  
geothermal power production, phase 2A  
[PB-261687/8] 15 p0347 N77-22653  
Computer simulation of geothermal reservoirs  
[PB-265104/0] 15 p0395 N77-27564
- GARIBOTTI, J. P.  
Composites for large space structures  
[IAP PAPER 77-65] 16 p0507 A77-51416
- GARNER, P. J.  
Energy and the oil industry 13 p0005 A77-11031
- GAROFALO, D.  
Regional energy availability from conversion of  
solid waste 15 p0304 A77-36433
- GARRETT, C.  
Predicting changes in tidal regime - The open  
boundary problem 14 p0199 A77-29076
- GARRIBBA, S.  
Statistical utility theory for comparison of  
nuclear versus fossil power plant alternatives  
15 p0291 A77-35015
- GARSON, D.  
Cost analysis of two air quality attainment  
strategies [PB-254182/9] 13 p0092 N77-10719
- GARY, J. H.  
Low-sulfur coal obtained by chemical  
desulfurization followed by liquefaction  
13 p0008 A77-11242
- GASANOVA, Z. I.  
Effect of nitrogenous bases on the thermal  
stability of jet fuels [NASA-TN-75131] 15 p0388 N77-27243
- GATZKE, B. S.  
Multi-mission uses for prop-fan propulsion  
15 p0339 N77-22127
- GAULT, J.  
Preliminary analysis of electric generation  
utilizing geopressured geothermal fluids  
13 p0030 A77-12752  
Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 4: Surface  
technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- GAUSS, A., JR.  
Solar energy storage [AD-A028083] 14 p0213 N77-17605
- GAUT, M. E.  
Electric energy from atmospheric water vapor  
13 p0077 A77-19097
- GAUTAM, S. R.  
Fuel conversion strategy impacts on compliance  
with photochemical oxidant standards  
15 p0333 A77-39585
- GAVERILOV, Y. Y.  
The relation between isotopic composition of argon  
and carbon in natural gases [NASA-TN-75134] 16 p0531 N77-30680
- GAVERILOVA, I. P.  
Effectiveness of heat-emitting coatings with  
variable degree of blackness 13 p0111 N77-12893
- GAUTHROP, W. E.  
Test and evaluation of the Navy half-watt RTG  
13 p0042 A77-12853
- GAY, E. C.  
Performance characteristics of solid  
lithium-aluminum alloy electrodes 13 p0007 A77-11107  
Review of electrode designs and fabrication  
techniques for lithium-aluminum/iron sulfide cells  
13 p0025 A77-12713  
Design and performance of Li-Al/iron sulfide cells  
for utility energy storage and electric vehicles  
[CONF-760617-3] 16 p0535 N77-31618
- GAY, W. F.  
Energy statistics: A supplement to the summary of  
national transportation statistics  
[PB-269301/8] 16 p0559 N77-33672
- GAZDARO, V.  
Energy management in residential and small  
commercial buildings [BNL-50576] 15 p0392 N77-27511
- GEBBEN, V. D.  
Investigation of excitation control for  
wind-turbine generator stability  
[NASA-TN-73745] 16 p0535 N77-31614
- GERMAN, J. E.  
The potential role of technological modifications  
and alternative fuels in alleviating Air Force  
energy problems [AD-A039597] 16 p0525 N77-30261
- GERHARD, G.  
A solar house with heat pipe collectors  
13 p0070 A77-18598
- GERHARD, H.  
A solar generator 15 p0268 A77-32403  
The solar system in the solar house Dornier/BWE in  
Essen 15 p0336 A77-39983
- GERHON, E.  
Environmental research needs for coal conversion  
and combustion technologies [PB-262159/7] 15 p0347 N77-22659
- GERHS, C. W.  
Balanced program plan. Volume 4: Coal conversion  
[ORNL-5123-VOL-4] 14 p0216 N77-18566
- GEIS, J. W.  
Hardened solar photovoltaics [AIAA PAPER 77-484] 14 p0172 A77-23904
- GERLFGAT, I. H.  
Calculation of a three-dimensional model for a  
conduction MHD machine with frame-type electrodes  
16 p0425 A77-44694
- GENSLER, W. G.  
LLL-Sohio solar process heat project. Report no.  
3: LLL solar energy group [UCID-16630-3] 13 p0123 N77-14604
- GENTRY, E.  
The design and development of a 30 kW-hr  
lithium-aluminum/iron sulfide electric vehicle  
battery 16 p0446 A77-48726
- GEORGE, A. E.  
Sulfur compounds in oils from the Western Canada  
Tar Belt 14 p0169 A77-23553
- GEORGE, J. H.  
Perturbation analysis of second-order effects in  
kinetics of oil-shale pyrolysis 13 p0070 A77-18585  
Mathematical modeling of in situ oil shale retorting  
14 p0196 A77-28434
- GEORGE, H.  
New materials for fluorosulfonic acid electrolyte  
fuel cells [AD-A036988] 15 p0380 N77-26640
- GEORGE, H. S.  
The Shenandoah Community Center - A total solar  
design concept 13 p0047 A77-13506
- GEORGE, T.  
Economic and energy considerations in MHD seed  
regeneration 15 p0332 A77-39574
- GEORGESCU, R.  
Hydrogen economy analysis using decision theory  
14 p0247 N77-21663
- GERDIN, G.  
Studies of deuterium-fueled Tokamak reactors  
16 p0435 A77-41357
- GERGELY, B.  
Coal gasification and its relation to tested power  
plants 14 p0136 A77-20074  
Energy assessment and possibilities of remote heat  
supply 15 p0338 A77-40350
- GERHARD, G. J.  
Dynamic tests of hydrogen-powered IC engines  
15 p0282 A77-33395  
Dynamic tests of hydrogen-powered IC engines  
14 p0244 A77-21633

- GERSEMAN, R.  
Environmental aspects of low Btu gas combustion 16 p0440 A77-48178
- GERSEMAN, A. W.  
Investigation of the thermophysical characteristics of low-temperature heat pipes with metal-fiber wicks 13 p0050 A77-14321  
An analytical study of the maximal heat-carrying capacity of heat pipes 16 p0411 A77-42260
- GERVAIS, R. L.  
Some material considerations involved in the application of solar energy to electric power generation 13 p0049 A77-13739  
A central receiver solar system applicable to central power stations 16 p0483 A77-49036  
Central receiver solar thermal system, phase 1, CPRL item 10 [SAN/1108-76/2] 14 p0231 N77-20591
- GEUTJES, A. J.  
A numerical model to evaluate the behavior of a regenerative heat exchanger at high temperature [TH-76-E-66] 15 p0377 N77-26439
- GHATAK, A. K.  
Conductivity of seeded combustion products of acetylene systems 15 p0288 A77-34039
- GHORNEY, E. L.  
Energy conversion and economics for geothermal power generation at Heber, California, Valles Caldera, New Mexico, and Ralt River, Idaho: Case studies [PB-261845/2] 14 p0251 N77-21712
- GHOSH, S.  
SNG from refuse and sewage sludge by the BIOGAS process 15 p0314 A77-37659
- GHOSH, S. P.  
Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells 16 p0420 A77-44059
- GIAQUINTA, G.  
Thin film solar acceptors 13 p0072 A77-19053
- GIBBS, C. F.  
Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source 16 p0425 A77-44675
- GIBBS, R. J.  
Brookhaven superconducting cable test facility [BNL-21780] 14 p0236 N77-21331
- GIBERT, J. P.  
A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs 13 p0014 A77-11591
- GIBRAT, R.  
Energy and environment post-2000 13 p0050 A77-14560  
Environment and energy production after the year 2000 13 p0056 A77-16203
- GIBSON, J.  
Present status of fluidised-bed combustion 15 p0303 A77-36422
- GIBSON, J. B.  
Comparative kinetics of high-temperature reaction between H<sub>2</sub>S and selected metal oxides 16 p0424 A77-44608
- GIDASPOW, D.  
Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770  
Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 15 p0278 A77-33363  
Hydrogen separation and production from coal-derived gases using Fe/x/TiNi/1-x/ 16 p0458 A77-48821  
Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 14 p0239 N77-21597
- GIEDT, W. H.  
Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle 13 p0029 A77-12746  
Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle [UCRL-78390] 14 p0221 N77-19587
- GIELLIS, R.  
Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists 16 p0497 A77-49157
- GIESSE, R.  
Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters [ANL-ES-54] 15 p0394 A77-27547
- GIL, V. V.  
Gas release during long-term operation of heat pipes 13 p0050 A77-14328
- GILBERT, B.  
Diffuser augmentation of wind turbines 16 p0490 A77-49093
- GILBERT, B. L.  
Fluid dynamics of diffuser augmented wind turbines 16 p0467 A77-48899  
Diffuser augmentation of wind turbines [CONF-760842-6] 16 p0521 N77-29610
- GILBERT, L. J.  
Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks 15 p0267 A77-32243  
Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks [NASA-TM-X-73613] 14 p0220 N77-19580
- GILL, A.  
Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations 16 p0428 A77-46250
- GILL, W. L.  
Preliminary design study of a baseline MIOS [NASA-TM-X-58193] 16 p0561 N77-34050
- GILLESPIE, A. R.  
Construction and interpretation of a digital inertia image 16 p0421 A77-44464
- GILLESPIE, R. S.  
Sandia Laboratories energy programs [SAND-77-0034] 16 p0555 N77-33629
- GILLI, P.  
Application of solar heat to buildings in Austria 13 p0079 A77-19114
- GILLIAN, M. L.  
The analysis of subsidence associated with geothermal development. Volume 1: Handbook [PB-263692/6] 15 p0369 N77-24714  
The analysis of subsidence associated with geothermal development. Volume 2: Research report [PB-263693/4] 15 p0369 N77-24715  
The analysis of subsidence associated with geothermal development. Volume 3: Information bank [PB-263694/2] 15 p0369 N77-24716
- GILLIGAN, J. E.  
The weatherability of solar energy utilization materials - Preliminary discussions 16 p0487 A77-49070  
Weatherability of solar energy utilization materials: Preliminary discussions [CONF-760821-11] 14 p0225 N77-19650
- GILLILAND, M. W.  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply 14 p0179 A77-25224  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply [PB-263761/9] 15 p0367 N77-44635
- GILLIS, R.  
4.8-megawatt fuel cell module demonstrator 16 p0447 A77-48738

- GILLIS, P. P.  
Metallurgical analysis of a plain carbon-steel plate after long-term service in a coal gasifier [PB-268106/2] 16 p0543 N77-32295
- GILLMAN, H. D.  
Investigation of metal fluoride thermal energy storage materials 16 p0451 A77-48767
- GILMAN, S. P.  
Experimental results for a heat pump system with thermal storage [COO-2704-3] 14 p0250 N77-21697
- GILMOUR, A. S., JR.  
High power study - power conditioning [AD-A038724] 16 p0522 N77-29625
- GIBBER, J.  
Study of corrosion and its control in aluminum solar collectors [COO-2934-76-1] 15 p0383 N77-26673
- GIMLEY, D. S.  
Photoelectrolysis with YFeC<sub>3</sub> electrodes 16 p0399 A77-40553
- GIRAMONTI, A. J.  
Conceptual design of underground compressed air storage electric power systems 16 p0451 A77-48770
- GIRAUD, A.  
Preliminary report on simulation of a heliostat field [ERDA-TR-158] 14 p0226 N77-19782
- GIROD, J.  
Energy demands: Modeling methods and techniques 15 p0264 A77-31595
- GISSLER, W.  
Investigation of a TiO<sub>2</sub>/electrolyte solar cell and the photocatalytic water decomposition 13 p0C77 A77-19094
- GITNER, S. J.  
A direct convertor based upon space charge effects 14 p0184 A77-26160
- GIUSTINI, F.  
Atmospheric pollution due to multi-stack emissions of medium and large-capacity thermal or thermoelectric plants 16 p0420 A77-44178
- GIVEN, P. H.  
The influence of the properties of coals on their conversion into clean fuels 13 p0009 A77-11245  
Problems and solutions in the use of coal analyses [FE-0390-1] 13 p0097 N77-11535
- GLADNEY, E. S.  
Composition and size distribution of in-stack particulate material at a coal-fired power plant 14 p0139 A77-21018
- GLANDT, E. D.  
Hydrogen production from water by means of chemical cycles 13 p0058 A77-16471
- GLASER, F. C.  
Variable cycle engines for V/STOL fighters 15 p0339 N77-22117
- GLASER, F. M.  
Potential environmental impacts of solar heating and cooling systems [PB-259970/2] 14 p0226 N77-19683
- GLASER, P. E.  
Feasibility of a satellite solar power station /SSPS/ 13 p0047 A77-13504  
Perspectives on Satellite Solar Power [AIAA PAPER 77-352] 13 p0066 A77-18257  
Solar thermal power generation 13 p0077 A77-19095  
Solar power from satellites 14 p0146 A77-21751  
The development of a satellite solar power station 14 p0203 A77-29577  
Development of the satellite solar power station 15 p0296 A77-35815  
Solar energy - Where are the opportunities 15 p0307 A77-36799
- GLASGOW, J.  
Experimental data and theoretical analysis of an operating 100 kW wind turbine 16 p0467 A77-48898
- GLASGOW, J. C.  
Early operation experience on the ERDA/NASA 100 kW wind turbine [NASA-TN-X-71601] 13 p0086 N77-10640
- GLASS, I. I.  
Utilization of geothermal energy [UTIAS-REVIEW-40] 13 p0087 N77-10644
- GLASSBY, C. R.  
A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results [PB-252485/8] 13 p0088 N77-10662  
A linear economic model of fuel and energy in the United States. Volume 2: Submodels and data [PB-252486/6] 13 p0089 N77-10663
- GLATTFELDER, A. H.  
Wide-range control of a thermal interconnection network 14 p0145 A77-21545
- GLAZE, J. A.  
Status of large neodymium glass lasers 14 p0168 A77-23503
- GLEBOV, I. A.  
High-power systems with ac generators and inertial storage banks for electrophysical devices 15 p0261 A77-31426
- GLENNING, B. D.  
Methanol as automotive fuel. Part 1: Straight methanol [CONF-750264-1] 15 p0389 N77-27246
- GLENDENNING, I.  
Ocean wave power 16 p0499 A77-49349
- GLENN, D. R.  
Thermal energy storage applied to residential heating systems 13 p0027 A77-12729  
Industrial energy conservation through integration of thermal energy storage into process energy dynamics 13 p0028 A77-12733  
Technical and economic feasibility of thermal energy storage [COO-2558-1] 14 p0222 N77-19605
- GLEW, D. B.  
Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 N77-20616
- GLICKSMAN, L. R.  
The proper use of thermal storages for a solar assisted heat pump heating system [ASME PAPER 76-WA/HT-76] 14 p0187 A77-26492
- GLORIOSO, R. M.  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project [ERDA/NSP-00603/75/T1] 14 p0215 N77-18561
- GLOVER, D. W.  
Precipitation scavenging of fossil-fuel effluents [PB-256649/5] 13 p0124 N77-14630  
Measurement of dry deposition of fossil fuel plant pollutants [PB-264495/3] 15 p0376 N77-25685
- GLOVER, L., III  
Evaluation and targeting of geothermal energy resources in the southeastern United States [VPI-SU-5103-1] 14 p0225 N77-19642
- GLOVER, S. F.  
A large solar heating system for a Saudi campus complex 16 p0430 A77-46550
- GNUGESSER, E.  
Application of solar energy in the high-temperature range 13 p0063 A77-17636
- GOAS, J.  
Utilization of wind energy for electrical power supplies to ESSOR stationary platforms 16 p0427 A77-45610
- GOBETE, F. W.  
Effects of selected R&D options on fuel usage in the commercial air system 14 p0201 A77-29472
- GOBLE, R. L.  
Solar hot water systems application to the solar building test facility and the Tech House 13 p0084 N77-10342

- GODDARD, A. J. H.  
Modelling the atmospheric dispersal of radioactive pollutants beyond the first few hours of travel  
15 p0395 N77-27603
- GODDIN, C. S.  
Evaluation of the Lawrence Livermore Laboratory in-situ coal gasification concept  
15 p0300 A77-36332
- GODET, M.  
Off-shore oil scenarios - Method and results  
13 p0018 A77-12282
- GOEBEL, J. A.  
Oxidation-erosion of materials in high velocity hot gases  
15 p0270 A77-32604
- GOEHLE, P.  
Hydrocarbon cracking developments in the DDR  
14 p0164 A77-23098
- GOEN, R. L.  
The potential for reusable homogeneous containers [PB-265100/8]  
16 p0518 N77-29007
- GOETZBERGER, A.  
Solar energy conversion with fluorescent collectors  
16 p0499 A77-49166
- GOFF, P. G.  
Development and applications of spatial data resources in energy related assessment and planning [CONF-761017-1]  
15 p0355 N77-23609
- GOFF, J. P.  
The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction  
13 p0042 A77-12850
- GOHARD, J. C.  
Wind energy conversion [PB-268718/4]  
16 p0559 N77-33667
- GOHRBAUDT, B.  
The electrical power system for Spacelab  
16 p0432 A77-46789  
Past experience - Basis for future advanced power systems for communications satellites [IAF PAPER 77-22]  
16 p0506 A77-51390
- GOLAR, M.  
Use of municipal waste for fuel  
15 p0291 A77-35149
- GOLD, R.  
Water requirements for steam-electric power generation and synthetic fuel plants in the western United States [PB-268067/7]  
16 p0540 N77-31667
- GOLD, R. S.  
Automotive gas turbine fuel control [NASA-CASE-LEW-12785-1]  
13 p0113 N77-13426
- GOLDBERG, M.  
Environmental research needs for coal conversion and combustion technologies [PB-262159/7]  
15 p0347 N77-22659
- GOLDBERG, M. D.  
Energy model data base program [BNL-21545]  
14 p0250 N77-21687
- GOLDEN, D. M.  
Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal  
16 p0442 A77-48489
- GOLDEN, J. E.  
The magma high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794  
Design considerations for a magma advanced fuel fusion reactor  
15 p0334 A77-39747
- GOLDEN, J. O.  
Low-sulfur coal obtained by chemical desulfurization followed by liquefaction  
13 p0008 A77-11242
- GOLDENBERG, E. S.  
Experimental study of several modes of operation of a laboratory section of a three-phase superconducting power transmission cable  
16 p0438 A77-47753
- GOLDIN, D. S.  
Transmitter experiment package for the communications technology satellite [NASA-CR-135035]  
15 p0360 N77-24332
- GOLDMAN, R. L.  
Segmented and self-adjusting wind turbine rotors  
16 p0468 A77-48902
- GOLDNER, R. B.  
Temperature dependence of the 10.6-microns reflectivity of ITO-coated silicon  
14 p0200 A77-29246
- GOLDSMITH, J. V.  
Solar photovoltaics - An aerospace technology [AIAA PAPER 77-293]  
13 p0065 A77-18225
- GOLDSMITH, M.  
Geothermal development and the Salton Sea  
14 p0194 A77-27352
- GOLDSMITH, P.  
Advanced photovoltaic power systems [AIAA PAPER 77-506]  
14 p0173 A77-23923
- GOLDSTEIN, D. J.  
Water requirements for an integrated SNG plant and mine operation  
13 p0060 A77-16651  
Water requirements for steam-electric power generation and synthetic fuel plants in the western United States [PB-268067/7]  
16 p0540 N77-31667
- GOLDSTEIN, H. L.  
Influence of heavy fuel oil composition and boiler combustion conditions on particulate emissions  
13 p0008 A77-11162
- GOLDSTEIN, R. J.  
Heat transfer - A review of 1975 literature  
13 p0002 A77-10615
- GOLDWATER, B.  
Demonstration of a Free-Piston Stirling Linear Alternator power conversion system  
16 p0465 A77-48880
- GOLIBERSUCH, D. C.  
Compressed air energy storage for electric utility load leveling  
16 p0458 A77-48825
- GOLOVIN, A. M.  
Evaporation of solution droplets in a high-temperature medium  
13 p0046 A77-13254  
Evaporation of a drop of solution in a high-temperature medium  
15 p0263 A77-31534
- GOLOVNER, I. M.  
Influence of doped-layer parameters on photoelectric characteristics of silicon photovoltaic cells  
13 p0014 A77-11916  
Investigation of p-Al<sub>x</sub>/Ga<sub>1-x</sub>/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra  
14 p0143 A77-21311
- GOLUBEV, V. S.  
Shock tube for investigations of high-temperature MHD generators  
13 p0054 A77-15665
- GOHEN, T.  
Energy and the future  
14 p0246 A77-21657
- GOODACRE, J. B.  
Heat pipe and space radiator developments  
13 p0120 A77-14391
- GOODALE, D.  
Thermionic converter performance with oxide collectors  
16 p0466 A77-48888
- GOODALE, D. B.  
High efficiency thermionic converter studies [NASA-CR-135263]  
16 p0546 A77-32592
- GOODENOUGH, J. B.  
The options for using the sun  
13 p0001 A77-10318
- GOODGER, E. B.  
Heavy-fuel flame radiation in gas turbine combustors - Exploratory results  
16 p0508 A77-51589
- GOODJOHN, A. J.  
Gas turbine HTGR - A total energy utilization option [AIAA 77-1016]  
16 p0403 A77-41560
- GOODMAN, J. B.  
Availability of potential coal supply through 1985 by quality characteristics [PB-256680/0]  
13 p0121 A77-14573
- GOODMAN, H. B.  
Optical and thermal design considerations for ideal light collectors  
16 p0474 A77-48956

- On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices  
16 p0488 A77-49073
- GOODMAN, T. W.  
Degasification and production of natural gas from an airshaft in the Pittsburgh coalbed  
[PB-258101/5] 14 p0210 A77-17555
- GOODSON, E. E.  
Optimization of automotive engine fuel economy and emissions  
15 p0320 A77-38373
- GOOLD, M. A.  
Solar electricity for military applications  
15 p0289 A77-34113
- GORADIA, C.  
An integrated photovoltaic/thermal High Intensity Solar Energy System/HISES/ concept for residential applications  
13 p0039 A77-12818
- GORBUNOV, L. A.  
Calculation of a three-dimensional model for a conduction MHD machine with frame-type electrodes  
16 p0425 A77-44694
- GORDEN, R. L.  
Historical trends in coal utilization and supply  
[PB-261278/6] 15 p0341 A77-22295
- GORDIENKO, V. V.  
Thermal properties of subsurface rocks in the Ukraine  
16 p0443 A77-48647
- GORDON, C. E.  
An energy center in Sri Lanka  
13 p0021 A77-12669
- GORDON, G. E.  
Composition and size distribution of in-stack particulate material at a coal-fired power plant  
14 p0139 A77-21018
- GORDON, R. S.  
Whirl stability of the pendulously supported flywheel system  
[ASME PAPER 77-APM-20] 15 p0323 A77-38837
- GORDON, R. T.  
A hybrid solar-assisted heat pump system for residential applications  
16 p0477 A77-48981
- GORDON, R. L.  
The economics of coal supply - The state of the art  
13 p0013 A77-11523
- GORE, B. F.  
Current fusion power plant design concepts  
[BNWL-2013] 16 p0549 A77-32894
- GORE, E.  
Design guidelines for energy conserving systems  
[PB-268989/1] 16 p0559 A77-33670
- GORGES, E. A.  
Economics of solid waste conversion  
16 p0433 A77-47211
- GORIN, E.  
Deashing of coal liquefaction products via partial deasphalting. I - Hydrogen-donor extraction effluents. II - Hydrogenation and hydroextraction effluents  
14 p0138 A77-20725
- GORMAN, P.  
Environmental studies of the St. Louis-Union Electric refuse firing demonstration  
15 p0315 A77-37669
- GORNOWSKI, E. J.  
Options for the conversion of fossil fuels  
15 p0335 A77-39835
- GORODZHA, L. V.  
Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field  
15 p0295 A77-35798
- GORSHEV, I. S.  
A microwave energy converter with a reversing magnetic field  
14 p0139 A77-21154
- GOSHPZHANOV, E.  
Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions  
15 p0286 A77-33435
- Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia  
16 p0427 A77-45548
- GOSSETT, J. E.  
Heat treatment of refuse for increasing anaerobic biodegradability  
[PB-252924/6] 13 p0101 A77-11577
- Heat treatment of refuse for increasing anaerobic biodegradability  
16 p0550 A77-32995
- GOTOH, M.  
Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy  
15 p0274 A77-33334
- GOTTLE, R. J., IV  
Alternative patterns of industrial energy consumption in the Northeast  
[BNL-50555] 15 p0364 A77-24597
- GOTTSCHALK, W. L.  
System performance of first residential solar installation in Charlottesville, Virginia, U.S.A. - Retrofitted indoor swimming pool  
16 p0479 A77-48999
- GOUGH, W. C.  
Adapting the experience of DOD/Industry to developing fusion power reactors  
[IAEA 77-1019] 16 p0404 A77-41561
- GOULBURN, J. E.  
The interaction of automotive-engine efficiency and exhaust pollution  
15 p0296 A77-35922
- GOUMI, L.  
The mysteries of nuclear programs  
13 p0011 A77-11337
- GOUREI, I.  
Selection of optimal pan color for solar water heater  
13 p0078 A77-19104
- GOVEK, E.  
Catalytic hydrogenation of solvent-refined lignite to liquid fuels  
13 p0008 A77-11243
- GRAF, P.  
Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters  
[ANL-ES-54] 15 p0394 A77-27547
- GRAFF, W. J.  
Solar power satellite: Analysis of alternatives for transporting material to geosynchronous orbit  
[NASA-TN-X-74680] 14 p0235 A77-21136
- GRAHAM, B. J.  
Feasibility of heating domestic hot water for apartments with solar energy  
[AD-A028418] 14 p0209 A77-16461
- GRAHAM, C. D.  
Research and development of low cost processes for integrated solar arrays  
[COO-2721-76-1] 15 p0383 A77-26670
- GRAHAM, R. E.  
MHD power generation - 1976 Status Report  
13 p0033 A77-12782
- GRAHAM, R. W.  
A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics  
13 p0021 A77-12613
- GRALLERT, H.  
The MBB solar houses - Design, operation, and experience  
14 p0197 A77-28678
- 80 per cent of the heat requirements satisfied by the sun  
15 p0304 A77-36450
- The MBB solar houses - Design, operation, and experience  
15 p0336 A77-39985
- GRAMMEL, S.  
Systems analysis of accelerator and storage ring systems for inertial fusion  
15 p0334 A77-39744
- GRANFERNANN, G. E.  
Studies of biofouling in ocean thermal energy conversion plants  
16 p0484 A77-49044
- GRANOFF, B.  
Pyrolysis kinetics for oil-shale particles  
16 p0401 A77-41316



- GRANT, A. J.  
Applications of the Woodall-Duckham two stage coal gasification 14 p0191 A77-27284  
Fluidised coal combustion - What can be done now 14 p0191 A77-27285
- GRANT, R. B.  
Energy requirements for air pollution control in the primary aluminum industry [PB-264483/9] 15 p0375 N77-25684
- GRASSIE, S. I.  
The use of planar reflectors for increasing the energy yield of flat-plate collectors 16 p0472 A77-48937  
Modelling of a solar-operated absorption air conditioner system with refrigerant storage 16 p0475 A77-48963
- GRASSIN, J.  
Study of a heliostat system for a solar thermal converter with an energy of 10 MW 14 p0150 A77-21811
- GRATHWOHL, H.  
The supply of the Federal Republic of Germany and Western Europe with energy, giving particular consideration to the oil and gas potential of the North Sea 15 p0334 A77-39673
- GRAVEL, H.  
Energy: A radical redirection 13 p0010 A77-11275
- GRAVES, D. H.  
Utilization of remote sensing techniques to detect land use effects on wildland water quality 13 p0071 A77-18984
- GRAVES, J. R.  
Use of heat pipes in electronic hardware 16 p0526 N77-30293
- GRAY, D. C.  
Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design 16 p0461 A77-48844
- GRAY, D. E.  
High efficiency engine cycles for air transport fuel economy 15 p0339 N77-22126
- GRAY, H. R.  
Potential structural material problems in a hydrogen energy system 15 p0281 A77-33389
- GRAY, J. A.  
Energy and the gas industry 13 p0005 A77-11032
- GRAY, K. E.  
Proceedings of Second Geopressed Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3] 14 p0249 N77-21678
- GRAY, L. W.  
Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems [PB-253097/0] 13 p0099 N77-11556
- GRAY, R. L.  
The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- GREEN, B.  
Analysis of the California energy industry [LBL-5928] 16 p0557 N77-33640
- GREEN, L., JR.  
Energy storage via calcium hydride production 13 p0032 A77-12774  
Hydroretorting of oil shale with nuclear process heat [ASME PAPER 76-WA/ENER-3] 14 p0185 A77-26432
- GREEN, M. A.  
The use of program GROTH to design and optimize geothermal power cycles 13 p0031 A77-12758  
Computer van programs - An assessment 14 p0137 A77-20391  
Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038  
Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804
- GREEN, R. B.  
High temperature thermal energy storage 16 p0491 A77-49099
- Survey of high temperature thermal energy storage [SAND-75-8063] 13 p0088 N77-10655
- GREEN, S., JR.  
Mechanisms of coal particle dissolution 13 p0059 A77-16475
- GREENBERG, D.  
Predicting changes in tidal regime - The open boundary problem 14 p0199 A77-29076
- GREENBERG, J.  
Large scale hydrogen production utilizing carbon in renewable resources 15 p0321 A77-38527
- GREENE, H.  
Influence of selected Federal statutes on energy development [BNWL-2084(RAP-5)] 15 p0346 N77-22638
- GREENE, M. I.  
Direct production of methane and benzene from coal 15 p0306 A77-36766
- GREENEICH, E. W.  
Thin film solar cells for terrestrial applications [PB-255606/6] 13 p0109 N77-12553  
Thin film solar cells for terrestrial applications [PB-265983/7] 16 p0523 N77-29635
- GREENSTEIN, T.  
Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems [PB-253097/0] 13 p0099 N77-11556
- GREENWALD, A. C.  
Silicon solar cells by high-speed low-temperature processing 15 p0258 A77-30728
- GREGORY, D. L.  
Alternative approaches to space-based power generation 14 p0199 A77-29066
- GREGORY, D. P.  
Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock 14 p0200 A77-29437  
Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility 15 p0302 A77-36344
- GREINER, P. C.  
Electricity and the energy 'gap' 14 p0195 A77-27890
- GRENON, H.  
A word on worldwide petroleum resources 13 p0011 A77-11336  
Concerning world oil resources. II - Statistical logistic models /King Hubbert's models/ 13 p0011 A77-11339  
World oil resources. III - The geological analogy method 13 p0012 A77-11341  
World petroleum resources. IV - Probabilistic methods 13 p0012 A77-11342  
The world's oil resources. V - Recovery rates 13 p0012 A77-11343  
Studies and thoughts on nuclear reactor systems 13 p0055 A77-15800  
Unconventional petroleum and natural gas resources. II - Additional gas resources 14 p0198 A77-28760  
Energy and natural resources 15 p0263 A77-31574
- GRESKO, T. H.  
Thermal energy storage applied to residential heating systems 13 p0027 A77-12729
- GRETHER, D.  
Assessment of the socio-economic and environmental aspects of the central receiver power plants 16 p0494 A77-49122  
Ecological considerations of the solar alternatives [LBL-5927] 16 p0558 N77-33655
- GRETHER, D. F.  
Results from circumsolar radiation measurements [LBL-5292] 15 p0382 N77-26657
- GRITZ, J.  
Research at the EURATOM-CCR Center 13 p0080 A77-19126
- GRUBBEL, W.  
Solar energy conversion with fluorescent collectors 16 p0499 A77-49166

- GREVSTAD, P. E.  
Improvement in phosphoric acid cell powerplant technology  
[AIAA 77-1011] 16 p0403 A77-41558
- GREY, J.  
An advanced energy conservation technology program; Proceedings of the Intersociety Workshop Conference, Airlie House, Va., March 24-26, 1976 13 p0045 A77-12928
- A rationale for large space-based solar power systems  
[AIAA PAPER 77-510] 14 p0173 A77-23926
- Space: A resource for earth - An AIAA review 15 p0269 A77-32440
- Space manufacturing facilities: Space colonies; Proceedings of the Princeton Conference, Princeton University, Princeton, N.J., May 7-9, 1975 15 p0295 A77-35801
- Creating a welcome for aerospace energy technology 16 p0413 A77-42561
- GRIEB, H.  
Advanced engine design concepts and their influence on the performance of multi-role combat aircraft 15 p0339 N77-22116
- GRIFFIN, J. H.  
Energy input-output modelling: Problems and prospects  
[PB-261925/2] 15 p0349 N77-22679
- GRIFFIN, R.  
Energy technologies for the West: Fission as an option  
[TID-27432] 16 p0538 N77-31647
- GRIFFIN, W. L.  
MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems  
[ORNL-HUD-MIUS-6] 14 p0249 N77-21684
- GRIFFITH, J. L.  
Making electricity from moderate temperature fluids 13 p0002 A77-10649
- Direct applications of geothermal energy 13 p0030 A77-12755
- GRIFFITH, J. T.  
Performance of an electric van fitted with a hydrodynamic torque converter transmission 14 p0160 A77-22897
- GRIFFITH, B. W.  
Solar energy utilization, solid state science, and a high efficiency amorphous-silicon absorber 16 p0487 A77-49065
- Electrofluid dynamics energy conversion research  
[AD-A029066] 14 p0218 N77-18593
- Fluid dynamic energy conversion and transfer processes  
[AD-A040589] 16 p0533 N77-31444
- GRIFFITHS, G. D.  
Heat pipe and space radiator developments 13 p0120 N77-14391
- GRIFFITHS, B. T.  
The effect of aerofoil characteristics on windmill performance 16 p0438 A77-47880
- GRIFFITHS, V.  
Corrosion of potential MHD preheater materials in liquid slag and slag-seed 15 p0327 A77-39541
- GRIGGS, E. I.  
Optimal mass flow rates through flat plate solar collector panels  
[ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524
- An experimental and analytical investigation of a solar water heater  
[ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- GRIGOREV, E. I.  
Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765
- Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421
- GRILIKHES, V. A.  
Combined cycles in single circuit solar refrigerating systems 15 p0286 A77-33434
- Study of the characteristics of convective heat transfer in cylindrical solar energy receivers by solving the conjugate problem of heat exchange 15 p0316 A77-37771
- Conjugate cycles of single-loop solar power and refrigeration plants 16 p0427 A77-45547
- Investigation of convective heat-transfer characteristics in cylindrical solar receivers by solution of the conjugate heat-exchange problem 16 p0437 A77-47427
- GRIMES, P. G.  
Redox bulk energy storage system study, volume 1  
[NASA-CR-135206-VOL-1] 16 p0553 N77-33608
- Redox bulk energy storage system study, volume 2  
[NASA-CR-135206-VOL-2] 16 p0553 N77-33609
- GRIMMER, D. P.  
Practical aspects of solar heating - A review of materials use in solar heating applications 13 p0049 A77-13743
- Solar process heat from concentrating flat-plate collectors 16 p0474 A77-48957
- GRIMMETT, E. S.  
Fluidized bed heat exchangers for geothermal applications 13 p0029 A77-12748
- Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations 16 p0455 A77-48799
- GRINGARTEN, A. C.  
Recovery of heat energy from deep or shallow aquifers 14 p0175 A77-24206
- GRISLIS, B. IA.  
Increase in the efficiency of heat and power systems using large artificial accumulators of heat 13 p0064 A77-17939
- GRODZKA, P. G.  
Cryogenic temperature control by means of energy storage materials  
[AIAA PAPER 77-763] 15 p0312 A77-37273
- GROHOVD, G. H.  
Technology and use of low-rank coals in the USA  
[CONF-760495-1] 15 p0392 N77-27519
- GROSPILS, A.  
Solar heating for a sports complex in Belgium 16 p0417 A77-42958
- GROSHKOVA, G. W.  
Effectiveness of heat-emitting coatings with variable degree of blackness 13 p0111 N77-12893
- GROSS, L.  
Wide-range control of a thermal interconnection network 14 p0145 A77-21545
- GROSS, R.  
Thermal conductivity measurement and prediction from geophysical well log parameters with borehole application  
[PB-262372/6] 15 p0347 N77-22654
- GROSS, S.  
Review of electrochemical impregnation for nickel cadmium cells  
[NASA-CR-155155] 16 p0552 N77-33601
- GROSSKREUTZ, J. C.  
Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design 16 p0461 A77-48844
- GROSSMAN, A. P.  
Evaluation of combined in-situ and surface retorting of oil shale tract C-b  
[PB-261064/0] 15 p0347 N77-22646
- GROSSMAN, E. D.  
Thermodynamic analysis of an oil reclamation process  
[PB-268524/6] 16 p0548 N77-32614
- GROSSMAN, G.  
Heat transfer analysis of a flat-plate solar energy collector 16 p0501 A77-50207
- GROVER, F. T.  
Geothermal energy resource utilization program planning  
[MTR-7137] 14 p0249 N77-21683
- GROVES, W. W.  
Energy from humid air  
[AIAA PAPER 77-730] 15 p0311 A77-37253

- GRUBER, C. L.  
Energy from humid air  
[AIAA PAPER 77-730] 15 p0311 A77-37253
- GRUBER, R. P.  
Solar array maximum power tracking with  
closed-loop control of a 30-centimeter ion  
thruster  
[NASA-TM-X-73643] 15 p0376 N77-26222
- GRUEN, D. M.  
HYCSOS - A solar heating, cooling and energy  
conversion system based on metal hydrides  
13 p0029 A77-12740  
A thermodynamic analysis of HYCSOS, a hydrogen  
conversion and storage system 15 p0280 A77-33387  
A thermodynamic analysis of HYCSOS, a hydrogen  
conversion and storage system 14 p0242 N77-21622
- GRUENDLER, A.  
Solar energy installation for the project 'Motto  
di Lena' in Minusio/Tessin 16 p0441 A77-48257
- GRZESKOWIAK, W.  
The minimum combustion gas recirculation ratio for  
fuel gas conversion in a MHD cycle 14 p0157 A77-22552
- GRZIWA, G.  
The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich 15 p0273 A77-33328
- GRZYBOWSKI, A.  
Curve of current delivered from MHD generator to a  
conventional power grid by inverter system 14 p0141 A77-21253
- GUARINO, V. J.  
Developing and testing of a wastewater recycler  
and heater  
[NASA-CR-154846] 16 p0531 N77-31040
- GUAZZONI, G.  
Composite material structures for  
thermophotovoltaic conversion radiator  
[AD-A026859] 13 p0132 N77-15519
- GUCERI, S. I.  
Research on solar energy storage subsystems  
utilizing the latent heat of phase change of  
paraffin hydrocarbons for the heating and  
cooling of buildings  
[PB-254665/3] 13 p0091 N77-10689
- GUENTHER, P. R.  
Atmospheric carbon dioxide variations at the South  
Pole 13 p0067 A77-18439
- GUENZER, C. S.  
Navy applications for terrestrial photovoltaic  
solar power  
[AD-A030529] 14 p0218 N77-18590
- GUERRA, C. E.  
Hydrogen by electrolysis to supplement pipeline  
gas supplies Technical and economic aspects  
[AIAA 77-1032] 16 p0405 A77-41569
- GUERRA, G.  
Energy utilization factor in civil transport  
aircraft 15 p0307 A77-36788
- GUESS, R. H.  
Development of a high performance and lightweight  
hybrid flywheel/battery powered electric vehicle  
drive 14 p0160 A77-22898  
Advanced motor developments for electric vehicles  
15 p0305 A77-36615  
Design of a current technology electric vehicle  
16 p0446 A77-48727
- GUHA, M. K.  
Utility views of MHD power generation  
[AIAA 77-1010] 16 p0403 A77-41557
- GUICHERIT, R.  
Distribution of some hydrocarbons in ambient air  
near Delft and the influence on the formation of  
secondary air pollutants 15 p0271 A77-32954
- GUIN, J.  
Mechanisms of coal particle dissolution  
13 p0059 A77-16475
- GUIZZI, G. L.  
Potentialities and limitations of the utilization  
of wind machines 13 p0061 A77-16787
- GUKHNAN, G. A.  
Potentialities of electric energy production by  
means of thermoelectric generators 14 p0154 A77-21847
- GUMEROV, KH. S.  
Equation solution accuracy in calculating jet  
engine characteristics 13 p0020 A77-12502
- GUNNESSON, S. G.  
The development of a 150 kW /200 HP/ Stirling  
engine for medium duty automotive application -  
A status report  
[SAE PAPER 770081] 16 p0424 A77-44559
- GUNKEL, R. J.  
A space station for the 1980's - A look at the  
next generation of operational systems and their  
functional requirements  
[ASME PAPER 77-ENAS-37] 16 p0432 A77-46878
- GUNKEL, W. W.  
Bioconversion of agricultural wastes for pollution  
control and energy conservation  
[TID-27164] 15 p0383 N77-26675
- GUNN, A. W.  
Solar heating and cooling in a commercial building  
16 p0477 A77-48983
- GUON, J.  
Storage of solar energy by inorganic  
oxide/hydroxides 16 p0494 A77-49109
- GUPTA, A. K.  
Conceptual design of a 10MW regenerative isobutane  
geothermal power plant  
[PB-261563/1] 15 p0349 N77-22683
- GUPTA, B. K.  
Ionization instability in non-equilibrium MHD  
generators 16 p0416 A77-42894
- GUPTA, B. P.  
Experimental evaluation of a cylindrical parabolic  
solar collector  
[ASME PAPER 76-WA/HT-13] 14 p0186 A77-26473  
Conceptual design of a parabolic dish solar  
collector using simulation techniques 15 p0318 A77-38211  
Technical feasibility of a modular dish solar  
electric system 16 p0483 A77-49034
- GUPTA, C. P.  
Use of hydrogen in automotive engines 15 p0283 A77-33401  
Use of hydrogen in automotive engines 14 p0244 N77-21639
- GUPTA, M. C.  
The rate of mass transfer in a solar regenerator  
15 p0323 A77-39109
- GURASHVILI, V. A.  
Shock tube for investigations of high-temperature  
MHD generators 13 p0054 A77-15665
- GURE, T.  
Solar flux density distributions on central tower  
receivers 15 p0256 A77-30318  
Solar flux density distributions on central tower  
receivers 16 p0484 A77-49038
- GUSHUE, J.  
Environmental research needs for coal conversion  
and combustion technologies  
[PB-262159/7] 15 p0347 N77-22659
- GUSTAFERRO, J. P.  
Forecast of likely US energy supply/demand  
balances for 1985 and 2000, and implications for  
US energy policy  
[PB-266240/1] 16 p0523 N77-29633
- GUTOV, V. B.  
Thermodynamic analysis of the formation of the  
oxides of nitrogen and sulfur in fuel combustion  
products 15 p0269 A77-32506
- GUTSALO, L. K.  
The nature and characteristics of the distribution  
of helium and argon isotopes in the geothermal  
waters of the Kuril Islands and Kamchatka  
13 p0048 A77-13589

- GUTSTEIN, M. U.  
Description of thermal storage sub-system designs  
for ERDA's 10-MWe Solar Central Receiver Pilot  
Plant  
[ASME PAPER 76-WA/HT-68] 14 p0187 A77-26491
- GUTTORSEN, G. E.  
Economic and institutional rationale for solar  
retrofitting - Case example: 'Project Sunshower'  
16 p0495 A77-49131
- GUYOL, W. E.  
Energy interrelationships. A handbook of tables  
and conversions factors for combining and  
comparing international energy data  
[PB-269034/5] 16 p0559 N77-33675
- GWINNER, D.  
Alternate fuels for road vehicles of the future  
13 p0051 A77-14584
- GYFTOPOULOS, E. P.  
Energy conservation and a healthy economy  
15 p0305 A77-36612
- GYORKE, D.  
Economic and energy considerations in MHD seed  
regeneration  
15 p0332 A77-39574

## H

- HAACKE, G.  
CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica  
substrates  
13 p0007 A77-11110
- Evaluation of cadmium stannate films for solar  
heat collectors  
14 p0198 A77-29021
- Cadmium stannate selective optical films for solar  
energy applications  
[PB-254879/0] 13 p0090 N77-10678
- Cadmium stannate selective optical films for solar  
energy applications  
[PB-261850/2] 15 p0348 N77-22672
- HAAR, W.  
Development of sodium/sulfur-cells  
13 p0026 A77-12716
- Some studies on sodium/sulfur cells  
13 p0055 A77-15813
- HAARMAN, R.  
The magnetic energy storage system used in ZT-1  
15 p0299 A77-36314
- HAAZ, G.  
Additional heating and refuelling for the ASDEX  
divertor Tokamak  
16 p0407 A77-41710
- HAAZ, W. R.  
Hydrocarbon fuel conditioner for a 1.5 kW fuel  
cell power plant  
14 p0195 A77-28168
- HABER, B.  
Solar cell array for concentrated sunlight  
16 p0460 A77-48836
- HABER, G.  
Solar power from the oceans  
14 p0190 A77-26724
- HABERSTROM, B. D.  
Performance of air-cooled flat plate collectors  
16 p0472 A77-48942
- HACKAM, B.  
Electric arc power collection for high-speed trains  
13 p0060 A77-16594
- HACKLEMAN, E. C., JR.  
Is an electric vehicle in your future  
16 p0441 A77-48301
- HADLEY, H., JR.  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film  
polycrystalline photovoltaic device for  
terrestrial applications  
16 p0486 A77-49059
- HAFFELE, W.  
Energy options open to mankind beyond the turn of  
the century  
[IAEA-CN-36/538] 16 p0560 N77-33679
- HAFFELI, R. C.  
Technology requirements for advanced earth-orbital  
transportation systems: Summary report  
[NASA-CR-2867] 16 p0550 N77-33255
- HAGGI, H.  
Heating of the Frascati Tokamak by means of quasi  
perpendicular neutral injection  
16 p0407 A77-41706

- HAENSEL, E.  
Prospecting for geothermal energy by geophysical  
methods  
16 p0499 A77-49575
- HAGEDORN, E. E.  
Experimental evaluation of a breadboard heat and  
product-water removal system for a space-power  
fuel cell designed with static water removal and  
evaporative cooling  
[NASA-TN-D-8485] 15 p0363 N77-24592
- HAGHEHEISTER, K.  
Development of low-power gas turbines with  
regenerative heat exchangers at NTU. I  
15 p0289 A77-34122
- The development of small regenerative gas turbines  
at NTU. II  
16 p0401 A77-41258
- Experience with a one stage variable  
axial turbine  
15 p0340 N77-22143
- HAGEN, H.  
The M.A.N. electrobus experience gained in  
large-scale tests  
14 p0160 A77-22900
- HAGEN, K. G.  
A ceramic heat exchanger for exhaust fired gas  
turbine power cycles  
16 p0445 A77-48719
- HAGEN, W. F.  
Status of large neodymium glass lasers  
14 p0168 A77-23503
- HAGENMULLER, P.  
The future of hydrogen as an energy source  
16 p0438 A77-47848
- HAGENS, R. C.  
Development of an assessment methodology for  
geopressured zones of the upper Gulf Coast based  
on a study of abnormally pressured gas fields in  
South Texas  
[COO-2687-4] 14 p0215 N77-18564
- Development of an assessment methodology for  
geopressurized zones of the upper Gulf Coast  
based on a study of abnormally pressured gas  
fields in south Texas  
[COO-2687-5] 15 p0361 N77-24571
- HAGER, A.  
Application of simulation studies to the design  
and improvement of fuel control systems for  
aviation turbine engines  
13 p0054 A77-15798
- HAGER, R.  
Design considerations for a noncircular Tokamak  
demonstration plant  
[GA-A-14074] 15 p0351 N77-22968
- HAGET, G.  
Impacts of future use of electric cars in US cities  
14 p0161 A77-22902
- HAGGARD, K. L.  
The architecture of a passive system of diurnal  
radiation heating and cooling  
16 p0423 A77-44488
- HAGGERTY, J. J.  
Spinoff 1977: An annual report  
[NASA-TN-74908] 16 p0561 N77-34049
- HAHM, O. J.  
Hot fuel gas desulfurization  
[PB-257036/4] 13 p0133 N77-15539
- Metallurgical analysis of a plain carbon-steel  
plate after long-term service in a coal gasifier  
[PB-268106/2] 16 p0543 N77-32295
- HAHM, R. E.  
The optical properties of chromium oxide films and  
the high temperature stabilization of silver  
films for photothermal solar energy conversion  
13 p0128 N77-15484
- HAHNE, E.  
Energy storage  
15 p0264 A77-31579
- HAIGES, R.  
Photovoltaic applications for the National Park  
Service  
16 p0460 A77-48837
- HAJELA, G. P.  
Geothermal power cycle analysis  
16 p0455 A77-48803
- HALAT, J.  
Design and field test of a steam powered downhole  
geothermal pump  
16 p0456 A77-48806

- HALE, P. J.  
Best-range flight conditions for cruise-climb  
flight of a jet aircraft  
13 p0085 N77-10379
- HALES, J. B.  
Precipitation scavenging of fossil-fuel effluents  
[PB-256649/5] 13 p0124 N77-14630
- HALL, D. E.  
Evaluation of the Lawrence Livermore Laboratory  
in-situ coal gasification concept  
15 p0300 A77-36332
- The dependence of current output of the Ti-Tl  
SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on  
photostationary state composition  
16 p0502 A77-50220
- HALL, F. F.  
Hydrogen production plants using electrolytic  
cells with low cost electrodes built into  
pressure tanks  
15 p0278 A77-33365
- Hydrogen production plants using electrolytic  
cells with low cost electrodes built into  
pressure tanks  
14 p0239 N77-21599
- HALL, I. J.  
Distribution of direct and total solar radiation  
availabilities for the USA  
16 p0471 A77-48926
- Effects of spectral variations on silicon cell  
output  
[SAND-76-9142] 15 p0381 N77-26653
- HALL, J. C.  
Development status of lithium-silicon/iron sulfide  
load leveling batteries  
16 p0448 A77-48741
- HALL, J. L.  
Environmental effects of solid waste as a  
supplemental fuel  
[IS-3852] 14 p0211 N77-17567
- HALL, J. W.  
Preliminary analysis of electric generation  
utilizing geopressured geothermal fluids  
13 p0030 A77-12752
- Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 4: Surface  
technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- HALL, R. E.  
Proceedings of the Stationary Source Combustion  
Symposium. Volume 1. Fundamental research  
[PB-256320/3] 13 p0116 N77-13569
- Proceedings of the Stationary Source Combustion  
Symposium. Volume 2. Fuels and process  
research and development  
[PB-256321/1] 13 p0116 N77-13570
- HALLETT, R. W., JR.  
The application of aerospace technology to solar  
thermal electric power generation  
[AIAA PAPER 77-294] 13 p0065 A77-18226
- Central receiver solar thermal system, phase 1,  
CPRL item 10  
[SAN/1108-76/2] 14 p0231 N77-20591
- HALS, F. A.  
Applications of the rapid devolatilization of coal  
in MHD power cycles  
14 p0141 A77-21249
- HALTER, A. W.  
Proceedings of the Workshop on Analysis of 1974  
and 1975 Power Growth  
[EPRI-BA-318-SR] 16 p0536 N77-31633
- HALTON, P. B.  
Long term energy alternatives for automotive  
propulsion. Synthetic fuel versus  
battery/electric system  
[PB-262512/7] 15 p0361 N77-24504
- Long term energy alternatives for automotive  
propulsion. Synthetic fuel versus  
battery/electric system  
[PB-262513/5] 15 p0361 N77-24505
- HANAWAY, C. B.  
Electric current from the direct conversion of low  
molecular weight C<sub>2</sub>H<sub>4</sub>O-compounds  
13 p0055 A77-15814
- HANASAKI, R. B.  
A structured surface for high performance  
evaporative heat transfer  
[AIAA PAPER 77-778] 15 p0312 A77-37283
- HANEL, B. B.  
Thermodynamic analysis of an oil reclamation process  
[PB-268524/6] 16 p0548 N77-32614
- HAMERSHA, J. W.  
Low-sulfur coal obtained by chemical  
desulfurization followed by liquefaction  
13 p0008 A77-11242
- Applicability of the Meyers Process for  
desulfurization of U.S. coal /A survey of 35  
coal mines/  
14 p0191 A77-27278
- Field test sampling/analytical strategies and  
implementation cost estimates: Coal  
gasification and flue gas desulfurization  
[PB-254166/2] 13 p0101 N77-11581
- HANID, Y. B.  
Solar water heater using hardened black polythene  
pipe absorbers  
13 p0073 A77-19060
- HAMIL, R. G.  
Program document for Energy Systems Optimization  
Program 2 (ESOP2). Volume 1: Engineering manual  
[NASA-CR-151422] 15 p0372 N77-25631
- HAMILTON, B.  
Experimental evaluation of a solar house heating  
system in Quebec  
16 p0475 A77-48968
- HAMILTON, C. L.  
Dynamic modeling and sensitivity analysis of solar  
thermal energy conversion systems  
16 p0461 A77-48845
- HAMILTON, G. W.  
The 120-keV beam direct conversion system for TFTR  
injectors  
[UCRL-52137] 15 p0355 N77-23610
- HAMILTON, J. R.  
Environmental assessment of geopressured waters  
and their projected uses  
[PB-268289/6] 16 p0544 N77-32579
- HAMILTON, R. C.  
Combined solar and petroleum energy HVAC system  
for a commercial building in Dhafran  
13 p0078 A77-19111
- HAMILTON, W.  
Impacts of future use of electric cars in US cities  
14 p0161 A77-22902
- HANLET, I. L.  
Initial operation of a solar heating and cooling  
system in a full-scale solar building test  
facility  
16 p0498 A77-49164
- HANLETT, R.  
Recent experimental studies of the interaction of  
potassium seed with coal slag in a direct-coal  
fired MHD generator  
14 p0141 A77-21250
- HANN, J. R.  
Fluidized bed adiabatic combustor power plants -  
Concepts and comparisons  
16 p0453 A77-48784
- HANNEEL, T. B.  
The low cost high performance generator /ICHPG/  
13 p0042 A77-12855
- The selenide isotope generators  
[AIAA PAPER 77-498] 14 p0173 A77-23916
- HANMER, B.  
Synthesis of substitute natural gas on the basis  
of coal  
15 p0268 A77-32249
- HANMERLI, B.  
Peak power and heavy water production from  
electrolytic H<sub>2</sub> and O<sub>2</sub> using CANDU reactors  
15 p0274 A77-33332
- HANNETTER, H. C.  
Utilization of remote sensing techniques to detect  
land use effects on wildland water quality  
13 p0071 A77-18984
- HAMMOND, A. L.  
Alcohol - A Brazilian answer to the energy crisis  
14 p0145 A77-21673
- Photovoltaics - The semiconductor revolution comes  
to solar  
16 p0407 A77-41638
- Photosynthetic solar energy - Rediscovering  
biomass fuels  
16 p0421 A77-44396

- HAMMOND, J. L.  
Antivear additives, wear studies on chemical addition agents for imparting an effective lubricating response in polysiloxane (silicone) fluids  
[AD-A033527] 15 p0340 N77-22270
- HAMMOND, H. J.  
Evaluation of a 1 kwh zinc chloride battery system  
[PB-260683/8] 14 p0236 N77-21356
- HAMMOND, O. H.  
Synthetic fuels - Prices, prospects, and prior art  
13 p0017 A77-12236
- HAMMOND, R. P.  
PACER - A practical fusion power concept  
13 p0035 A77-12793
- HAMODA, H. F.  
Anaerobic sludge digestion - A potential energy source  
16 p0439 A77-47970
- HAMPEL, V. E.  
Research leading to the production and early use of numeric data banks of material properties and system analyses  
[UCRL-50038-76-2] 15 p0364 N77-24601
- HAMPL, E. F., JR.  
Transport theory of 3M high-performance thermoelectric materials  
13 p0042 A77-12848
- HANCOCK, O. G.  
A practical solar concentrator  
14 p0171 A77-23657
- HANCOCK, O. G., JR.  
Solar cooling of a Florida Welcome Station - A demonstration  
16 p0476 A77-48973
- HAND, P.  
Domestic hot water and solar energy in Ireland  
16 p0430 A77-46608
- HANDLEY, L. H.  
Improvement in phosphoric acid cell powerplant technology  
[AIAA 77-1011] 16 p0403 A77-41558  
4.8-megawatt fuel cell module demonstrator  
16 p0447 A77-48738
- HANDWERK, J. G.  
Low-sulfur coal obtained by chemical desulfurization followed by liquefaction  
13 p0008 A77-11242
- HANITSCH, R.  
Predicted and measured finite-width effects in linear induction machines  
16 p0413 A77-42628
- HANKIN, J. W.  
Effect of reservoir temperature decline on geothermal power plant design and economics  
16 p0456 A77-48805
- HANKINS, J. D.  
Cost optimal deployment of mirrors associated with a high temperature solar energy system  
14 p0181 A77-25901
- HANLEY, G. H.  
New options for satellite power systems /SPS/  
[AIAA PAPER 77-1028] 16 p0419 A77-43392
- HANNON, B. H.  
Techniques for the analysis of total energy and labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697  
Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- HANSEN, L. K.  
Status of research on advanced thermionic converters  
16 p0466 A77-48889
- HANSON, J. A.  
Hydrogen in the seaward advancement of industrial societies  
15 p0285 A77-33417  
Hydrogen in the seaward advancement of industrial societies  
14 p0246 N77-21656
- HANSON, R. J.  
An investigation of condensation heat transfer in a closed tube containing a soluble noncondensable gas  
[NASA-CR-149095] 13 p0085 N77-10465
- HANTHAN, R. G.  
Liquid-metal MHD - Cycle studies and generator experiments  
13 p0034 A77-12785
- Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 N77-26988
- HAWWAY, J. E., JR.  
Fluidized-bed incineration of waste materials  
16 p0434 A77-47216
- HAWYK, K.  
Method and equipment for the introduction of liquid waste fuels into a fluidized layer  
[BLL-RTS-10400] 15 p0359 N77-24205
- HARASHIMA, F.  
A study of the effects of new transportation systems on urban transportation and environment by computer simulation  
16 p0430 A77-46652
- HARDER, C. E.  
Characteristics of a first generation commercial fusion power plant  
[GA-A-13661] 13 p0093 N77-10891
- HARDESTY, D. R.  
Combustion rates and mechanisms of pulverized coals and coal-derived fuels  
[SAND-76-8229] 14 p0224 N77-19638
- HARDIE, R. W.  
Analysis of electrical power generation costs  
15 p0257 A77-30600  
Economic analysis of the need for advanced power sources  
[HEDL-SA-989] 13 p0131 N77-15509
- HARDIN, T. C.  
Methanol from coal fuel and other applications  
[ORAU-126] 13 p0094 N77-11200
- HARDMAN, C. C.  
Development progress on the Sulfur Cycle Water Decomposition System  
16 p0457 A77-48813
- HARDT, H. H.  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations  
[PB-261910/4] 15 p0350 N77-22688  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations  
[PB-267937/1] 16 p0554 N77-33619
- HARDY, D. B.  
Status report: Lawrence Livermore Laboratory wind energy studies  
[UCID-17157-1] 14 p0221 N77-19588  
Wind power studies: Field measurement priorities for numerical analysis of wind energy  
[UCRL-50034-76-3] 14 p0249 N77-21681  
Wind power studies: Regional wind energy measurements  
[UCRL-50034-76-4] 15 p0392 N77-27527
- HARDY, M. P.  
Large-scale thermal storage in rock - Construction, utilization, and economics  
16 p0451 A77-48769
- HARHAY, W. C.  
Baseline test data for the EVA electric vehicle  
13 p0025 A77-12704
- HARLING, O. K.  
Solar pond stability experiments  
16 p0482 A77-49028
- HARBER, C. E.  
The photosynthesis energy factory - Analysis, synthesis, and demonstration  
16 p0449 A77-48753
- HARSON, S.  
Solar-optical analyses of a mass-produced plastic circular Fresnel lens  
14 p0181 A77-25906
- HARSON, S. Y.  
Characteristics of the concentrated solar flux produced by the PMSC prototype  
16 p0474 A77-48953
- HARMS, W.  
Natural gas storage in salt caverns  
15 p0334 A77-39670
- HARRENSTIEN, R. P.  
Solar cooling of a Florida Welcome Station - A demonstration  
16 p0476 A77-48973  
Gulf Stream OTEC resource potential and environmental impact assessment overview  
16 p0485 A77-49048
- HARRIGAN, R. W.  
Economic study of solar total energy  
16 p0494 A77-49124

- Economic study of solar total energy  
[SAND-76-5291] 14 p0216 N77-18574  
Nonbiological photochemical energy conversion, can  
it compete  
[SAND-76-5762] 15 p0393 N77-27541
- HARRIS, H. G.  
Perturbation analysis of second-order effects in  
kinetics of oil-shale pyrolysis 13 p0070 A77-18585  
Mathematical modeling of in situ oil shale retorting  
14 p0196 A77-28434
- HARRIS, J. C.  
Destroying chemical wastes in commercial scale  
incinerators. Facility report no. 2, Surface  
Combustion Division, Midland-Ross Corporation  
[PB-268232/6] 16 p0542 N77-32051
- HARRIS, J. S.  
Gallium arsenide concentrator system  
[AIAA PAPER 77-487] 14 p0172 A77-23907
- HARRIS, J. S., JR.  
Development of an (AlGaAs-Ga As) graded band gap  
solar cell  
[NASA-CR-145161] 15 p0355 N77-23603
- HARRIS, L. P.  
A summary of the ECAS MHD power plant results  
[NASA-TN-X-73491] 13 p0086 N77-10642  
Energy Conversion Alternatives Study (ECAS), phase  
2. Volume 2: Advanced energy conversion  
systems - conceptual designs. Part 3: Open  
cycle gas turbines and open cycle MHD  
[NASA-CR-134949-VOL-2-PT-3] 15 p0379 N77-26634  
Energy Conversion Alternatives Study (ECAS), phase  
2. Volume 3: Research and development plans  
and implementation assessment  
[NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- HARRIS, W. B.  
Reinforced pillow solar water heater  
16 p0493 A77-49114
- HARRISON, D. P.  
Comparative kinetics of high-temperature reaction  
between H<sub>2</sub>S and selected metal oxides  
16 p0424 A77-44608
- HARRISON, J. H.  
Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361
- HARRISON, J. S.  
Energy and the coal industry  
13 p0005 A77-11030
- HARRISON, J. W.  
Technology and economics of flue gas NO<sub>x</sub> oxidation  
by ozone  
[PB-261917/9] 15 p0350 N77-22700
- HARRISON, T. D.  
Solar Collection Module Test Facility,  
instrumentation fluid loop number one  
[SAND-76-0425] 16 p0535 N77-31619
- HARRISON, W. B.  
Dip coating process: Silicon sheet growth  
development for the large-area silicon sheet  
task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513
- HARRY, I. L.  
ERDA Fuel Cell Applied Research Program  
16 p0447 A77-48736
- HARSCH, W. C., JR.  
Near-term advanced electric vehicle batteries  
14 p0161 A77-22909
- HART, G.  
A hydrogen-halogen energy storage system for  
electric utility applications  
16 p0457 A77-48818
- HART, R. E.  
Sensitivity of solar-cell performance to  
atmospheric variables. 2: Dissimilar cells at  
several locations  
[NASA-CR-2010] 15 p0379 N77-26624
- HARTER, R. W.  
Continuously-variable transmission concepts  
suitable for flywheel hybrid automobiles  
16 p0444 A77-48705
- HARTH, R. E.  
Hydrogen production process by means of nuclear  
energy  
15 p0273 A77-33327  
Hydrogen production process by means of nuclear  
energy  
14 p0237 N77-21553
- HARTLEY, R. P.  
Pollution control in geothermal energy  
16 p0452 A77-48772  
Environmental impact of major solar power  
development  
16 p0452 A77-48772
- HARTMAN, T.  
Design and simulation studies for the Shenandoah  
Community Center large-scale solar cooling  
demonstration  
[ASME PAPER 76-WA/SOL-15] 14 p0189 A77-26520
- HARTNETT, J. P.  
Alternative energy sources  
15 p0261 A77-31461  
The case for alternative energy sources  
15 p0262 A77-31469
- HARVEY, C. A.  
Air quality considerations in transportation  
planning: Findings and recommendations on  
transportation control planning, phase 2  
[PB-256424/3] 13 p0110 N77-12576
- HARVEY, G. W.  
Transportation programming, economic analysis, and  
evaluation of energy constraints  
[PB-262878/2] 15 p0370 N77-25018
- HARVEY, W. W.  
Study of silica scaling from geothermal brines  
[PB-262890/7] 15 p0357 N77-23626
- HARWELL, W.  
Re-entrant groove heat pipe  
[AIAA PAPER 77-773] 15 p0312 A77-37280  
The International Heat Pipe Experiment  
13 p0120 N77-14389
- HASEGAWA, A.  
Concept of a fusion burner  
13 p0061 A77-17014
- HASEGAWA, J.  
Studies on the energy system of Hokkaido. I -  
First attempt: Model-I. II - Various data and  
their basis. III - Simulations by Model-I  
15 p0287 A77-33526
- HASELL, P. G., JR.  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121
- HASENZAH, W. V.  
Superconducting energy storage development for  
electric utility systems  
[LA-UR-76-2294] 15 p0381 N77-26649
- HASLETT, J.  
Domestic hot water and solar energy in Ireland  
16 p0430 A77-46608
- HASLETT, R.  
Molten salt thermal energy storage for utility  
peaking loads  
16 p0451 A77-48765
- HASTINGS, D. E.  
Study of the maximum Hall voltages and  
interelectrode breakdown in the channel of an  
open-cycle MHD generator - A joint U.S.-U.S.S.R.  
experiment on the UO2 facility MHD generator  
15 p0329 A77-39554
- HASTINGS, L. J.  
An analytical and experimental evaluation of the  
plano-cylindrical Fresnel lens solar concentrator  
16 p0473 A77-48952  
An analytical and experimental investigation of a  
1.8 by 3.7 meter Fresnel lens solar concentrator  
[NASA-TP-1005] 16 p0529 N77-30617
- HASTINGS, S. E.  
Window design strategies to conserve energy  
[PB-269297/8] 16 p0559 N77-33669
- HATANI, R.  
Improved use of energy  
13 p0079 A77-19123  
Hydrogen production from nuclear waste energy  
15 p0274 A77-33331
- HATCH, G. L.  
Status of research on advanced thermionic converters  
16 p0466 A77-48889
- HATORI, T.  
Concept of a fusion burner  
13 p0061 A77-17014
- HATTORI, S.  
A new design for the high-performance  
sodium-sulfur battery  
[SAE PAPER 770281] 16 p0424 A77-44564

- HAUG, R. T.  
Sludge processing to optimize digestibility and energy production  
16 p0439 A77-48100
- HAUGHIAN, J. M.  
Update on the development of 120-keV multi-megawatt neutral beam source  
15 p0335 A77-39749
- HAUSENBAUER, T. C.  
The fuel efficiency potential of a flywheel hybrid vehicle for urban driving  
13 p0020 A77-12664
- HAUSER, J. R.  
Performance limitations of silicon solar cells  
15 p0257 A77-30711
- HAUSER, S. G.  
Exploring stability criteria of solar ponds [ASME PAPER 76-WA/HT-62]  
14 p0187 A77-26489
- HAUSZ, W.  
Role of the heat storage well future U.S. energy systems [PB-263480/6]  
15 p0367 A77-24634
- HAUTALA, R. R.  
The use of functionalized polymers as photosensitizers in an energy storage reaction  
16 p0501 A77-50208
- HAWK, S. A.  
Destator test program evaluation [AD-A034260]  
15 p0360 A77-24410
- HAY, J. E.  
The climatology of available solar energy for Canada  
16 p0471 A77-48924
- Climatological constraints on the development of solar energy in Canada  
16 p0480 A77-49005
- HAYDEN, H. B.  
Corrosion problems in solar energy systems  
15 p0270 A77-32603
- HAYNES, W. M.  
Magnetic suspension densimeter for measurements on fluids of cryogenic interest  
13 p0007 A77-11093
- HAYNES, W. P.  
The SYNTHANE process - Current status  
14 p0192 A77-27286
- HAYS, L.  
Biphase turbines for diesel bottoming  
16 p0449 A77-48755
- HAZELRIGG, G. A., JR.  
The economic viability of pursuing a space power system concept [AIAA PAPER 77-353]  
13 p0066 A77-18258
- Satellite solar power - Will it pay off [AIAA 77-1027]  
16 p0404 A77-41567
- Space power system design and development from an economic point of view  
16 p0464 A77-48872
- Space-based solar power conversion and delivery systems study. Volume 1: Executive summary [NASA-CR-150146]  
13 p0129 A77-15494
- Space-based solar power conversion and delivery systems study. Volume 3: Economic analysis of space-based solar power systems [NASA-CR-150148]  
13 p0129 A77-15496
- HEADMAN, B.  
Open-cycle coal burning MHD power plants for commercial service  
15 p0333 A77-39578
- HEALY, J. B., JR.  
Heat treatment of refuse for increasing anaerobic biodegradability [PB-252924/6]  
13 p0101 A77-11577
- HEAP, M. P.  
Environmental aspects of low Btu gas combustion  
16 p0440 A77-48178
- Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames [PB-259911/6]  
14 p0234 A77-20639
- HEAPS, J. D.  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project [NASA-CR-149242]  
13 p0105 A77-12513
- HEARTH, D. P.  
Hypersonic technology-approach to an expanded program  
13 p0051 A77-14597
- HEATON, T. R.  
ERDA's central receiver solar thermal power system studies  
16 p0526 A77-30279
- HEBRAWEK, J.  
Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program [PB-257770/8]  
14 p0208 A77-16452
- HECK, F. M.  
Pulsed energy and switching requirements for Tokamak ohmic heating [IA-UR-76-2473]  
15 p0397 A77-27932
- HECK, R. M.  
Durability testing at one atmosphere of advanced catalysts and catalyst supports for automotive gas turbine engine combustors, part 1 [NASA-CR-135132]  
16 p0520 A77-29519
- HEDDEN, K.  
Coal gasification  
15 p0262 A77-31471
- HEDERMAN, W. F.  
An evaluation of very large airplanes and alternative fuels [AD-A040532]  
16 p0532 A77-31334
- HEDLEY, W. H.  
A method for evaluating SO2 abatement strategies  
15 p0293 A77-35169
- Design of minimum-weight diffusion batteries [PB-266217/9]  
16 p0518 A77-28645
- HEDSTROM, J. C.  
Simulation analysis of passive solar heated buildings - Preliminary results  
16 p0406 A77-41582
- A simplified method for calculating required solar collector array size for space heating  
16 p0480 A77-49007
- HEEB, C. M.  
ENFORM: An energy information system [BNWL-2195]  
16 p0542 A77-32016
- HEFNER, J. M.  
An overview of concepts for aircraft drag reductions  
16 p0543 A77-32092
- HEFT, R. C.  
Costs and energy efficiency of a dual-mode system [NASA-CR-154251]  
16 p0518 A77-29003
- HEGAZI, A. I.  
Factors affecting the use of solar energy for cooling  
13 p0078 A77-19108
- HEGELS, S.  
Hydrogen production using nuclear heat  
13 p0057 A77-16211
- HEHMANN, R. F.  
Materials research and evaluation for geothermal corrosion environments [COO-2602-2]  
14 p0210 A77-17216
- Hydrogen sulfide stress corrosion cracking in materials for geothermal power [COO-2576-3]  
16 p0519 A77-29269
- HEILMANN, W.  
Future propulsion plants. I  
15 p0268 A77-32251
- Development of low-power gas turbines with regenerative heat exchangers at MTU. I  
15 p0289 A77-34122
- The development of small regenerative gas turbines at MTU. II  
16 p0401 A77-41258
- HEIN, L. A.  
Mechanical thermal motor [NASA-CASE-MPS-23062-1]  
13 p0104 A77-12402
- HEINA, M. H.  
Optical performance of fixed zenith-moving azimuth paraboloid-cylindrical concentrator  
16 p0417 A77-42955
- HEINBOCKEL, J. B.  
A comparison of GaAs and Si hybrid solar power systems  
16 p0406 A77-41584
- Analysis of GaAs and Si solar energy hybrid systems [NASA-CR-2800]  
14 p0229 A77-20564
- HEITNER, K.  
Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters [ANL-ES-54]  
15 p0394 A77-27547



- HEKIMIAN, K. K.  
Methane gas recovery from sanitary landfills in  
Southern California  
14 p0182 A77-26077
- HELGESON, J. L.  
Control of oxides of sulfur from stationary  
sources in the south coast air basin of California  
[PB-261754/6] 15 p0348 N77-22668
- HELLEBREKERS, W. H.  
Experimental fluctuation analysis in a noble gas  
MHD generator  
15 p0326 A77-39535
- HELLER, A.  
Spectral response and efficiency relations in  
semiconductor liquid junction solar cells  
15 p0264 A77-31823
- Stable semiconductor liquid junction cell with 9  
percent solar-to-electrical conversion efficiency  
15 p0290 A77-34429
- Solar conversion efficiency of pressure sintered  
cadmium selenide liquid junction cells  
15 p0320 A77-38367
- HELLER, L.  
The significance of coal in the future energy  
picture  
13 p0018 A77-12247
- HELLING, J.  
Hybrid propulsion system for motor vehicles with  
predominantly intermittent mode of operation  
14 p0171 A77-23900
- HELMAN, J. S.  
Photoelectronic properties of CdTe-electrolyte  
heterojunctions - Feasibility as solar energy  
converters  
15 p0320 A77-38330
- HELMS, R. E.  
Study and program plan for improved heavy duty gas  
turbine engine ceramic component development  
[NASA-CR-135230] 16 p0542 N77-32033
- HEMMAPLARDH, K.  
Applications of a doubly-fed induction machine in  
a large flywheel energy storage system  
16 p0520 N77-29602
- HEMPHILL, C. W.  
Analysis of the technical and cost feasibility of  
solar and/or wind energy systems for Coast Guard  
public quarters  
[AD-A028332] 14 p0209 N77-16460
- HENCH, T.  
CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica  
substrates  
13 p0007 A77-11110
- HENDRICKSON, G.  
Dip coating process: Silicon sheet growth  
development for the large-area silicon sheet  
task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513
- HENDRICKSON, R. L.  
Gas turbine electric powerplants  
[AIAA PAPER 77-346] 13 p0066 A77-18254
- HENKES, W.  
Additional heating and refuelling for the ASDEX  
divertor Tokamak  
16 p0407 A77-41710
- HENRIKSEN, D. L.  
A guide for the conversion to and maintenance of  
hydrogen-fueled, spark-ignited engines  
13 p0033 A77-12779
- Water induction in hydrogen-powered IC engines  
14 p0171 A77-23721
- Prototype hydrogen automobile using a metal hydride  
15 p0282 A77-33398
- Water induction in hydrogen-powered IC engines  
14 p0243 N77-21631
- Prototype hydrogen automobile using a metal hydride  
14 p0244 N77-21636
- Guide for the conversion to and maintenance of  
hydrogen-fueled, spark-ignited engines  
[TRF-1086] 16 p0511 N77-28324
- HENRY, J. D., JR.  
Charge characteristics of particles in coal  
derived liquids - Measurement and origin  
16 p0412 A77-42408
- HENRY, J. F.  
The photosynthesis energy factory - Analysis,  
synthesis, and demonstration  
16 p0449 A77-48753
- Design, operation and economics of the Energy  
Plantation  
16 p0497 A77-49154
- HENRY, J.-F.  
Design, operation and economics of the energy  
plantation  
15 p0315 A77-37667
- Solid fuels from biomass - Some environmental and  
economic considerations  
16 p0445 A77-48712
- HENSON, H. K.  
Vapor-phase fabrication of massive structures in  
space  
[AIAA PAPER 77-542] 15 p0270 A77-31597
- HENSON, F. L.  
Pace and grade related to the oxygen and energy  
requirements, and the mechanics of treadmill  
running  
15 p0396 N77-27689
- HENTSCHEL, P.-J.  
The conservation of air purity and its effect on  
the energy economy  
13 p0049 A77-13811
- HEPPENHEIMER, T. A.  
On the feasibility of small power satellites  
15 p0298 A77-36264
- HERBST, R. J.  
Energy requirements for air pollution control in  
the primary aluminum industry  
[PB-264483/9] 15 p0375 N77-25684
- HEREDY, L. A.  
Development status of lithium-silicon-iron sulfide  
load-leveling batteries  
13 p0026 A77-12714
- Development status of lithium-silicon/iron sulfide  
load leveling batteries  
16 p0448 A77-48741
- HERGET, W. F.  
Determination of SO<sub>2</sub> concentrations from a  
coal-burning power plant stack by Fourier  
spectrometry  
15 p0296 A77-36024
- HERKE, F. P., JR.  
Photovoltaic system test facility electromagnetic  
interference measurements  
[NASA-TN-X-73640] 15 p0343 N77-22608
- HERMANN, W.  
The Philips energy-experimentation house - Results  
and experience  
15 p0336 A77-39982
- Calculation and optimization of solar-energy  
systems which provide hot water  
15 p0337 A77-39988
- HERMES, W. L.  
Performance, emissions, and physical  
characteristics of a rotating combustion  
aircraft engine  
[NASA-CR-135119] 15 p0376 N77-26134
- HERONIMUS, W. E.  
Design and operational evaluation of a 25 kW wind  
turbine generator for residential heating  
applications  
16 p0468 A77-48901
- Investigation of the feasibility of using  
windpower for space heating in colder climates.  
The final design and manufacturing phase of the  
project  
[ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- HERR, K. C.  
Solar process heat from concentrating flat-plate  
collectors  
16 p0474 A77-48957
- HERREIRA, G.  
An assessment of wind-powered generators for  
navigational aids  
16 p0468 A77-48900
- HERRICK, C. S.  
Progress on the selective removal of H<sub>2</sub>S from  
gasified coal using an immobilized liquid membrane  
15 p0318 A77-38146
- HERMANN, D.  
Finite length effects in linear induction machines  
with different iron contours  
16 p0413 A77-42629
- HERVERT, G. L.  
Optimization of Pt-doped Kocite (trademark)  
electrodes in H<sub>2</sub> PO<sub>4</sub> fuel cells  
[AD-A025326] 13 p0107 N77-12529

- BERWIG, L. O.**  
Prospectus on commercialization of solar heating and cooling systems 16 p0470 A77-48920  
Summary of the role of planning and analysis in the development of the Federal solar energy program 16 p0470 A77-48923  
Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132
- BESKEY, G. T.**  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser 15 p0326 A77-39532
- BESS, H.**  
Durability testing at one atmosphere of advanced catalysts and catalyst supports for automotive gas turbine engine combustors, part 1 [NASA-CR-135132] 16 p0520 N77-29519
- BEUSQUIN, CH.**  
Solar heating for a sports complex in Belgium 16 p0417 A77-42958
- BOWES, S. A.**  
Optimization of composite flywheel design 15 p0260 A77-31044
- BOWIG, G. H.**  
Technology of large area Cu/x/S-CdS solar cells 14 p0149 A77-21798  
Investigation on the crystalline structure of Cu/x/S-CdS solar cells 14 p0149 A77-21803  
The physical principles of photoelectric conversion 14 p0202 A77-29568
- BREWITT, H. C.**  
Optimal mass flow rates through flat plate solar collector panels [ASME PAPER 76-WA/SOL-19] 14 p0190 A77-26524  
An experimental and analytical investigation of a solar water heater [ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- BROWN, E. W.**  
Energy from the wind 14 p0179 A77-25575
- BRUNAN, G. A.**  
Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer 13 p0062 A77-17541
- BRUNWOOD, J. B.**  
Performance and NOx emissions modeling of a jet ignition prechamber stratified charge engine [SAE PAPER 760161] 13 p0016 A77-12150  
Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases [PB-263523/3] 15 p0354 N77-23518  
Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory [PB-262980/6] 15 p0356 N77-23619
- BIBL, J. J.**  
Cryogenic fuel systems for motor vehicles 16 p0411 A77-42166
- BICKLEY, J. S.**  
Flywheel module for electric vehicle regenerative braking 16 p0447 A77-48728
- BIERONYMUS, W. H.**  
Long-range forecasting properties of state-of-the-art models of demand for electric energy. Volume 2: Annotated bibliography [PB-261766/0] 14 p0251 N77-21718
- BIRRS, R. S.**  
Gaseous electrode development at ENEC 15 p0325 A77-39530
- BIGGIN, R. M. R.**  
Solar heating for buildings in Ontario - Experience and analysis of single, multiple residential and commercial low rise buildings 16 p0476 A77-48975  
Preliminary assessment of the potential for medium and large capacity wind generators used as fuel savers for ac diesel based power systems in Ontario 16 p0489 A77-49085
- BIGUCHI, H.**  
A study on solar tower power system 14 p0152 A77-21832
- BIJIKATA, K.**  
Fundamental research on heat transfer performances of solar focusing and tracking collector 16 p0502 A77-50223
- BIKITA, H.**  
Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions 16 p0412 A77-42407
- BILAL, J. A.**  
Cryogenic design for large superconductive energy storage magnets 16 p0411 A77-42156
- BILDEBRANDT, A. F.**  
A new method for collector field optimization 13 p0074 A77-19070  
Solar tower characteristics 15 p0274 A77-33333  
Power with heliostats 16 p0433 A77-47174  
Solar tower characteristics 14 p0237 N77-21562
- BILDEBRANDT, U.**  
Non-nuclear energy technology. Low temperature cable for power transmission [BMFT-FB-T-76-01] 14 p0210 N77-17372
- BILLENBRAND, S. J.**  
Waste heat vs conventional systems for greenhouse environmental control: An economic assessment [ORNL-TM-5069] 13 p0088 N77-10656
- BILL, G. H.**  
The United States energy dilemma - How can we solve it 16 p0415 A77-42855
- BILL, J. D.**  
Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618] 15 p0387 N77-27020
- BILL, J. E.**  
A method of testing for rating solar collectors based on thermal performance 13 p0019 A77-14408  
Initial test results for a solar-cooled townhouse in the mid-Atlantic region 14 p0170 A77-23655
- BILL, R. H.**  
Field ionization for laser isotope separation [EPRI-NP-334] 16 p0552 N77-33512
- BILLEN, L. W.**  
Hydrocarbon fuels from solar energy via the alga Botryococcus brauni [ARL/EPCH-ENG-148] 16 p0513 N77-28576
- BILLENBRAND, L. J.**  
Combustion additives for pollution control: A state-of-the-art review [PB-264068/8] 15 p0359 N77-24316
- BILLY, C.**  
Periodically adjustable concentrators adapted to solar cell panels 13 p0074 A77-19068  
Periodically adjustable concentrators adapted to solar cell panels 14 p0166 A77-23385
- BIRNBO, M.**  
Fundamental research on heat transfer performances of solar focusing and tracking collector 16 p0502 A77-50223
- BIRNBLAU, A.**  
Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power [ERDA-76-69] 13 p0130 N77-15506
- BIRCHMAN, R. A.**  
The environmental effects of using coal for generating electricity [PB-267237/6] 16 p0524 N77-29655
- BIRNS, R. W.**  
Advanced supersonic transport propulsion requirements [AIAA PAPER 77-831] 16 p0410 A77-41969
- BIRNLE, B. K.**  
Energy utilization index method for predicting building energy use. Volume 2: Proposed supplement to TB ENG 529 [AD-A040344] 16 p0521 N77-29608
- BIOKI, Y.**  
Ceramic thin film CdTe solar cell 14 p0135 A77-19635

- HIPPKKE, W.**  
On the production of town gas from off-gases of the chemical processing industry 14 p0164 A77-23099
- HIPSHER, M. S.**  
Heat transfer considerations of a nonconvecting solar pond heat exchanger [ASME PAPER 76-WA/SOL-4] 14 p0188 A77-26509
- HIRES, S. D.**  
Performance and NOx emissions modeling of a jet ignition prechamber stratified charge engine [SAE PAPER 760161] 13 p0016 A77-12150
- HIRLEMAN, E. D., JR.**  
In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures 16 p0440 A77-48173
- HIRSCHFELD, F.**  
Geothermal power - The 'sleeper' in the energy race 13 p0056 A77-15845  
The future with fusion power 14 p0205 A77-29938  
Whatever happened to the Wankel engine 15 p0272 A77-33125  
Electrochemical energy conversion. I - Electric vehicle propulsion 15 p0303 A77-36410  
Electrochemical energy conversion. II - Utilities, marine and space applications 16 p0400 A77-40686  
What's holding up coal gasification 16 p0423 A77-44522  
Wind power - Pipe dream or reality 16 p0442 A77-48503
- HIRSCHFELDER, G.**  
Improvements in energy conversion technology 16 p0505 A77-51154
- HIRSCHKROW, R.**  
Study of unconventional aircraft engines designed for low energy consumption [NASA-CR-135136] 13 p0127 N77-15043
- HIRSHBERG, A. S.**  
Solar energy in buildings: Implications for California energy policy [NASA-CR-152686] 15 p0343 N77-22613
- HIRST, E.**  
Modeling residential energy use 13 p0027 A77-12726  
Historical patterns of residential and commercial energy uses 15 p0298 A77-36244  
Residential energy use alternatives to the year 2000 15 p0307 A77-36768  
Energy and economic effects of residential energy conservation programs 16 p0448 A77-48743  
Residential energy use alternatives to the year 2000 [CONF-76C648-1] 14 p0223 N77-19625  
Engineering-economic model of residential energy use [ORNL-TM-5470] 14 p0231 N77-20580  
Improved engineering-economic model of residential energy use [ORNL-CCN-8] 16 p0557 N77-33644
- HIRT, J. E.**  
Methane gas recovery from sanitary landfills in Southern California 14 p0182 A77-26077
- HIRONA, H.**  
Development of a liquid hydrogen car 15 p0282 A77-33394  
Development of a liquid hydrogen car 14 p0244 N77-21632
- HISCOCKS, R. D.**  
The dynamics of STOL /The Daniel and Florence Guggenheim Lecture/ [ICAS PAPER 76-01] 13 p0081 A77-19247
- HISE, E. C.**  
Potential for energy conservation technology transfer [CONF-760536-1] 14 p0211 N77-17573  
Annual cycle energy system: Initial investigations [ORNL-TM-5525] 15 p0364 N77-24599
- HISSAN, H. A.**  
An integrated process model of the Fischer-Tropsch process for liquid fuels production from coal 15 p0318 A77-38213
- HISSONG, D. W.**  
Reductant gases for flue gas desulfurization systems [PB-254168/8] 13 p0092 N77-10722
- Fuel contaminants. Volume 1: Chemistry [PB-256020/9] 13 p0103 N77-12231  
Production and processing of US tar sands: An environmental assessment [PB-266266/6] 16 p0513 N77-28575
- HITTLE, D. C.**  
Method for estimating solar heating and cooling system performance 14 p0170 A77-23653  
Method for estimating solar heating and cooling system performance [AD-A026041] 13 p0116 N77-13557  
Interim feasibility assessment method for solar heating and cooling of Army buildings [AD-A026588] 13 p0124 N77-14606  
Predicting the performance of solar energy systems [AD-A035608] 15 p0373 N77-25660  
Market evaluation study: Solar domestic water heaters for DOD barracks [AD-A036479] 16 p0516 N77-28611
- HIX, J.**  
Description of Provident House, King City, Ontario 16 p0495 A77-49133
- HIZA, M. J.**  
Magnetic suspension densimeter for measurements on fluids of cryogenic interest 13 p0007 A77-11093
- HO, C. H.**  
Approaches to chemical class analyses of fossil derived materials [CONF-770301-5] 16 p0532 N77-31271
- HO, C. T.**  
Enhancement of diffusion length in EFG ribbon solar cells under illumination 16 p0503 A77-50293
- HO, R.**  
The magma high energy advanced fuel direct conversion fusion power plant 13 p0035 A77-12794  
Advanced fuel fusion application to manned space propulsion 16 p0436 A77-47367
- HOAGLAND, J. R.**  
Petrology and geochemistry of hydrothermal alteration in borehole Mesa 6-2, East Mesa geothermal area, Imperial Valley, California [PB-258871/3] 14 p0215 N77-18541
- HOBSON, M. J.**  
Conceptual design of underground compressed air storage electric power systems 16 p0451 A77-48770
- HOCKETT, R. S.**  
High temperature thermal energy storage system, Na2SO4 + SO3 reversibly yields Na2S2O7 16 p0450 A77-48764
- HODES, G.**  
Photoelectrochemical energy conversion and storage - The polycrystalline CdSe cell with different storage modes 14 p0196 A77-28463
- HODGSON, J. W.**  
Methanol from coal fuel and other applications [ORAU-126] 13 p0094 N77-11200
- HOEDENAKER, R. W.**  
Anik B, the new Canadian domestic satellite 16 p0499 A77-49249
- HOEHLER, B.**  
Hydrogen production process by means of nuclear energy 15 p0273 A77-33327  
Hydrogen production process by means of nuclear energy 14 p0237 N77-21553
- HOEHNE, K.**  
Air electrodes for H2-air fuel cells with alkali electrolyte 13 p0065 A77-18196
- HOENISCH, S.**  
Theoretical investigations on the effect of the distance between channels on the efficiency of aluminum flat-plate collectors 16 p0418 A77-43049
- HOERSTER, R.**  
The Philips energy-experimentation house - Results and experience 15 p0336 A77-39982  
Calculation and optimization of solar-energy systems which provide hot water 15 p0337 A77-39988

- HOFFMAN, H. W.  
Thermal energy storage for building heating and cooling applications  
[ORNL-TM-5700] 15 p0344 N77-22617  
Low-temperature thermal energy storage  
[ORNL-TM-5795] 16 p0536 N77-31631
- HOFFMAN, J. A.  
Coupled dynamics analysis of wind energy systems  
[NASA-CR-135152] 14 p0228 N77-20558
- HOFFMAN, H. Z.  
The dependence of current output of the TI-TL SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on photostationary state composition 16 p0502 A77-50220
- HOFFMAN, F. R.  
Energy recovery by mini-hydroelectric projects 14 p0183 A77-26089
- HOPFSTEDT, D. J.  
Composite technology - The boom is under way 15 p0287 A77-33616  
Advanced helicopter structural design investigation. Volume 1: Investigation of advanced structural component design concepts  
[AD-A024662] 13 p0102 N77-12052
- HOGAN, W.  
Energy Technologies for the West: Economic Growth and Energy  
[TID-27429] 16 p0538 N77-31648
- HOGUE, B. A.  
Effect of reservoir temperature decline on geothermal power plant design and economics 16 p0456 A77-48805
- HOKANSON, J. C.  
A study to obtain verification of Liquid Natural Gas (LNG) tank loading criteria  
[AD-A025716] 13 p0120 N77-14492
- HOKE, R. C.  
Pressurized fluidized-bed coal combustion 16 p0454 A77-48788
- HOLCOMB, L.  
Status of the NASA Space Power Program  
[AIAA PAPER 77-505] 14 p0173 A77-23922
- HOLCOMB, L. B.  
Technology for power in space 16 p0463 A77-48865
- HOLLAND, T. R.  
Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling  
[NASA-CR-150032] 13 p0086 N77-10638
- HOLLANDS, K. G. T.  
Radiant transmittance of V-corrugated transparent sheets with application to solar collectors  
[ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506  
Correlation equation for hourly diffuse radiation on a horizontal surface 16 p0422 A77-44481  
Solar collectors 16 p0471 A77-48335
- WATSON: A solar heating simulation and economic evaluation program  
[NP-21307] 15 p0364 N77-24603
- Determining the technical and economic feasibility of utilizing solar energy for heating buildings in Canada  
[NP-21308] 15 p0365 N77-24611
- Studies on methods of reducing heat losses from flat plate solar collectors  
[COO-2597-2] 15 p0395 N77-27554
- HOLLEMAN, T. J.  
Radioisotope power sources in the terrestrial and marine environment 14 p0196 A77-28170
- HOLLIS, C. G.  
Thermal effects on biodegradation of pollutants in water  
[PB-261512/8] 15 p0350 N77-22709
- HOLLOWAY, J. R.  
EPA resource recovery demonstration - Summary of air emissions analyses 15 p0313 A77-37630
- HOLMAN, A. S.  
Annual cycle energy system: Initial investigations  
[ORNL-TM-5525] 15 p0364 N77-24599
- HOLMAN, R. R.  
Liquid-metal magnetohydrodynamic system evaluation 13 p0034 A77-12784
- HOLMGREN, J.  
Coal gasification power generation 15 p0310 A77-37000
- HOLMGREN, J. D.  
Development of the Westinghouse coal gasification process - A status report 16 p0446 A77-48722
- HOLSHOUSE, D. F.  
Method for estimating solar heating and cooling system performance 14 p0170 A77-23653  
Method for estimating solar heating and cooling system performance  
[AD-A026041] 13 p0116 N77-13557  
Interim feasibility assessment method for solar heating and cooling of Army buildings  
[AD-A026588] 13 p0124 N77-14606  
Predicting the performance of solar energy systems  
[AD-A035608] 15 p0373 N77-25660
- HOLT, B.  
Energy conversion and economics for geothermal power generation at Heber, California, Valles Caldera, New Mexico, and Ralt River, Idaho: Case studies  
[PB-261845/2] 14 p0251 N77-21712
- HOLT, J. F.  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser 15 p0326 A77-39532
- HOLTOM, J. K.  
Interfacing building design and solar energy research and standards 16 p0494 A77-49120
- HOLTIN, C. E.  
Design factors for a cost effective solar collection system 16 p0496 A77-49143
- HOLYE, D.  
Optical measurements of mean particle size in the exhaust of a coal-fired MHD generator  
[WSS/CI PAPER 76-53] 16 p0508 A77-51611
- HOLY, W.  
Coal liquefaction with soluble transition-metal complexes 13 p0070 A77-18584
- HOMOLA, F.  
Current problems in energy development and energy sciences 14 p0194 A77-27882
- HONDA, T.  
Experiment on MHD generator with a large-scale superconducting magnet /ETL Mark V/ 13 p0049 A77-13728  
Experiment on MHD generator with a large scale superconducting magnet /ETL Mark V/ 15 p0325 A77-39527
- HONIG, B. H.  
Progress in switching technology for MBTS systems 15 p0303 A77-36377
- HOOD, R. V., JR.  
The aircraft energy efficiency active controls technology program  
[AIAA 77-1076] 16 p0415 A77-42784
- HOOGENDOORN, C. J.  
Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219
- HOOGHEVEN, A.  
Distribution of some hydrocarbons in ambient air near Delft and the influence on the formation of secondary air pollutants 15 p0271 A77-32954
- HOOPER, D. Q.  
ECAS MHD system studies 14 p0142 A77-21268
- HOPKINS, D. B.  
Update on the development of 120-keV multi-megawatt neutral beam source 15 p0335 A77-39749
- HOPKINS, J. P.  
Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137926] 13 p0126 N77-15007

- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137927] 13 p0126 N77-15008
- HOPKINS, M. M.  
A preliminary cost benefit analysis of space colonization 16 p0431 A77-46771
- HOPKINS, T. L.  
Black magnetic spherule fallout in the eastern Gulf of Mexico 13 p0052 A77-14890
- HOPMANN, H.  
Development of a 10 kWe solar thermal power station 14 p0154 A77-21844
- HOPPER, R. E., JR.  
Solar energy retrofit for existing buildings 14 p0168 A77-23444
- HORA, H.  
Advanced fuel nuclear reaction feasibility using laser compression. I 16 p0435 A77-47358  
Advanced fuel nuclear reaction feasibility using laser compression. II 16 p0435 A77-47359
- HORIGONE, T.  
A terrestrial solar thermal electric power system - Development of basic model system 16 p0422 A77-44478  
Fundamental studies on heat storage of solar energy 16 p0423 A77-44490
- HORIO, M.  
Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile 14 p0145 A77-21698
- HORNADY, R. S.  
Schlieren measurements of a high density z-pinch 13 p0060 A77-16697
- HORNBUCKLE, F. L.  
The ATS-6 power system - Hardware implementation and orbital performance 13 p0040 A77-12831  
The ATS-6 power system: Hardware implementation and orbital performance [NASA-TP-1023] 16 p0543 N77-32229
- HORNBURG, C. D.  
Preliminary research on Ocean Energy Industrial Complexes 16 p0484 A77-49042  
Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 N77-18562  
Preliminary research on ocean energy industrial complexes, phase 1 [ORO-4915-3] 14 p0248 N77-21669
- HORNING, W.  
Laser propulsion [TAP PAPER 76-166] 13 p0003 A77-10931
- HORNSTRA, P.  
Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion 14 p0161 A77-22910
- HOROWITZ, G. F.  
Energy recovery by mini-hydroelectric projects 14 p0183 A77-26089
- HOROWITZ, H. H.  
An environmental assessment of a 638 MWe molten carbonate fuel cell power plant 16 p0453 A77-48781  
Application of the Alstom/Exxon alkaline fuel cell system to utility power generation [EPRI-EM-384] 16 p0557 N77-33643
- HOROWITZ, M.  
Assessment of the socio-economic and environmental aspects of the central receiver power plants 16 p0494 A77-49122
- HORROX, A. J. W.  
Metalhydrides [OUEL-1146/76] 13 p0094 N77-11158
- HORSTENKE, A.  
Storage of thermal energy in molten salts and metals [NASA-TT-P-17412] 14 p0220 N77-19574
- HORTON, T. L. O.  
System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications 16 p0445 A77-48718
- HORVATH, R. E.  
An evaluation of very large airplanes and alternative fuels [AD-A040532] 16 p0532 N77-31334
- HOSKINS, R.  
Improved engineering-economic model of residential energy use [ORNL-COR-8] 16 p0557 N77-33644
- HOTCHARD, K. T.  
The structure of building specifications [PB-257581/9] 13 p0132 N77-15524
- HOUGHTBY, W. E.  
Advanced fuel cell technology and applications 16 p0447 A77-48735
- HOUMOUZIADIS, J.  
Variable geometry for high performance aircraft engines 13 p0062 A77-17264  
Experience with a one stage variable geometry axial turbine 15 p0340 N77-22143
- HOUSE, P. A.  
Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 N77-18562  
Helical-rotor expander applications for geothermal energy conversion [UCRL-52043] 14 p0221 N77-19586
- HOUSEMAN, J.  
Onboard hydrogen generation for automobiles 13 p0020 A77-12663  
Hydrogen-rich gas generator [NASA-CASE-WPO-13560-1] 13 p0086 N77-10636
- HOVEL, H. J.  
An isothermal etchback-regrowth method for high-efficiency Ga/1-x/Al/x/As-GaAs solar cells 15 p0257 A77-30372  
Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723  
Solar cells for terrestrial applications 16 p0485 A77-49050
- HOVINGH, J.  
Development scenario for laser fusion [UCRI-76980] 14 p0216 N77-18575
- HOWARD, E. B.  
Transportation energy conservation data book [ORNL-5198] 13 p0086 N77-10643
- HOWARD, F. S.  
Potential structural material problems in a hydrogen energy system 15 p0281 A77-33389
- HOWARD, J. B.  
Coal devolatilization and hydrogasification 14 p0200 A77-29450  
Basic studies of coal pyrolysis and hydrogasification [PB-254878/2] 13 p0096 N77-11511
- HOWARD, J. H.  
Geology and potential uses of the geopressure resources of the Gulf Coast [UCID-17163] 14 p0215 N77-18562
- HOWARD, J. R.  
Fluidisation and gas combustion in a rotating fluidised bed 15 p0264 A77-31674
- HOWARD, P. H.  
Desulfurization of coal by use of chemical comminution 16 p0418 A77-43009
- HOWE, E. D.  
A proposed method of rating the thermal performance of solar collectors 16 p0473 A77-48946
- HOWELL, J. R.  
Optimum solar collector operation for maximizing cycle work output 15 p0255 A77-30313  
Predicted daily and yearly average radiative performance of optimal trapezoidal groove solar energy collectors 16 p0472 A77-48943  
Solar energy for process heat 16 p0481 A77-49020  
The effect of non-direct insolation on the radiative performance of trapezoidal grooves used as solar energy collectors 16 p0502 A77-50214

- The evaluation of surface geometry modification to improve the directional selectivity of solar energy collectors [PB-258848/1] 14 p0233 N77-20618
- HOWELL, Y.  
1-MW solar boiler tested 15 p0303 A77-36349
- HOWER, R.  
Solar high technology and architecture 16 p0495 A77-49129
- HOYLE, C. S.  
Use of calculated displaced shapes to define the reflected light pattern from a focused collector 16 p0473 A77-48948
- HUBBY, V.  
The disk geometry applied to open cycle MHD power generation - Experiments and theoretical considerations 15 p0325 A77-39531
- HSIA, Y.-P.  
Evaluation of coal liquefaction efficiency based on various ranks 13 p0009 A77-11244
- HSIEH, C. K.  
The effect of dropwise condensation on glass solar properties 16 p0422 A77-44485
- HSU, M. S. S.  
Electrochemical power and hydrogen generation from high temperature electrolytic cells 13 p0025 A77-12709
- HSU, Y.-Y.  
A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673
- Clean fuels from biomass 14 p0167 A77-23390
- HU, C.  
New analysis of a high-voltage vertical multijunction solar cell 13 p0069 A77-18490
- Analysis of silicon solar cells with stripe geometry junctions 14 p0156 A77-22079
- HU, S. D.  
Comparative state-of-the-art assessment of gas supply modeling [EPRI-PA-201] 16 p0539 N77-31656
- HUANG, C. J.  
Solar power satellite: Analysis of alternatives for transporting material to geosynchronous orbit [NASA-TM-X-74680] 14 p0235 N77-21136
- HUANG, K. T. S.  
Retorting of single oil shale blocks with nitrogen and air 13 p0024 A77-12696
- HUANG, V. S.  
Molten salt thermal energy storage systems: Salt selection [COO-2888-1] 15 p0365 N77-24609
- HUBBARD, B. W.  
PACER - A practical fusion power concept 13 p0035 A77-12793
- HUBER, D.  
Experimental study of the theoretical and technological possibilities to manufacture solar cells using GaInAs layers on GaAs structures [BNFT-PE-W-76-10] 14 p0212 N77-17584
- HUBER, B. D.  
User manual for GECOST: A computer model for geothermal cost analysis. Volume 2: Binary cycle version [BNWL-1942-V2] 15 p0345 N77-22632
- HUBER, W. C.  
Study of Lyndon B. Johnson Space Center utility systems [NASA-TM-58196] 15 p0388 N77-27161
- HUBERMAN, H.  
Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies [AD-A034995] 15 p0377 N77-26491
- HUBERT, J.  
100 MW large industrial gas turbine 14 p0155 A77-22022
- HUBLER, G. K.  
Navy applications for terrestrial photovoltaic solar power [AD-A030529] 14 p0218 N77-18590
- HUCKSTEP, P. L.  
Analysis of thermal performance of 'Solaris' water-trickle solar collector [ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526
- Performance and analysis of 'Solaris' water-trickle solar collector 16 p0472 A77-48939
- Performance and analysis of SOLARIS water-trickle solar collector [CONF-760821-9] 14 p0232 N77-20599
- Analysis of thermal performance of Solaris water-trickle solar collector [CONF-761107-17] 15 p0382 N77-26668
- Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water [CONF-761143-1] 15 p0382 N77-26669
- HUDDLESTON, B. L.  
Composite flywheel development [Y-2072] 15 p0388 N77-27194
- HUDSON, B.  
Relationship of energy growth to economic growth under alternative energy policies [BNL-50500] 14 p0223 N77-19620
- HUDSON, W. R.  
NASA electric propulsion program [AIAA PAPER 76-1068] 13 p0045 A77-13033
- HUEBNER, B.  
Combination power plants for improved utilization of fossil fuels 13 p0045 A77-12939
- MHD - Energy transformation by burning coal 13 p0045 A77-12940
- HUEHNS, T.  
Predicted and measured finite-width effects in linear induction machines 16 p0413 A77-42628
- Finite length effects in linear induction machines with different iron contours 16 p0413 A77-42629
- HUEHNING, R.  
Fuel cells 13 p0055 A77-15804
- HURTER, U.  
Optimum wind-energy conversion systems 14 p0155 A77-21936
- HUFFMAN, P. W.  
Advanced thermionic converter development 13 p0043 A77-12862
- Thermionic converter studies at Thermo Electron 16 p0466 A77-48887
- Evaluation of MHD-thermionic-steam cycles 16 p0467 A77-48895
- High efficiency thermionic converter studies [NASA-CR-135263] 16 p0546 N77-32592
- HUFFMAN, G. L.  
EPA's program in environmental research in wastes-as-fuel 15 p0315 A77-37668
- HUGHES, D. W.  
The interaction of automotive-engine efficiency and exhaust pollution 15 p0296 A77-35922
- HUGHES, E. E.  
Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary [PB-255994/6] 13 p0107 N77-12533
- Impacts of synthetic liquid fuel development. Automotive market. Volume 2 [PB-255995/3] 13 p0108 N77-12534
- Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7] 15 p0361 N77-24504
- Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262513/5] 15 p0361 N77-24505
- HUGHES, P. J.  
Simulation study of several solar heating systems with offpeak auxiliary 16 p0406 A77-41587
- Simulation study of several solar heating systems with offpeak auxiliary 16 p0479 A77-49001
- Simulation study of several solar heating systems with offpeak auxiliary [CONF-760842-13] 15 p0393 N77-27534

- HUGHES, R. O.  
The sun-tracking control of solar collectors using high-performance step motors 15 p0291 A77-35030
- HUGHES, T.  
On the optimum orientation of solar collectors 15 p0322 A77-38789
- HUGHES, T. D. R.  
Accelerated response of thermopile pyranometers 13 p0019 A77-12405
- HUGHES, W. L.  
Development and adaptation of field modulated generator systems for wind energy applications [PB-263604/1] 15 p0357 N77-23625
- HULL, C. W.  
Worldwide energy development - Delayed opportunities 14 p0147 A77-21762
- HULL, J. F.  
Transportation energy conservation data book [ORNL-5198] 13 p0086 N77-10643
- HULLS, K.  
Wave power 16 p0418 A77-43011
- HULSTROM, R. L.  
Definition study for photovoltaic residential prototype system [NASA-CR-135056] 13 p0113 N77-13533  
Solar radiation atmospheric transmission research, phase 1 [PB-266010/8] 16 p0518 N77-28689
- HUMBERSTON, M. J.  
Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262
- HUMES, T.  
Wind energy conversion [PB-256198/3] 13 p0115 N77-13552  
Wind energy conversion [PB-268718/4] 16 p0559 N77-33667
- HUMM, R. F.  
Experimental polyurethane foam roofing systems [AD-A031046] 14 p0210 N77-17255
- HUMPHREY, J. H.  
In situ combustion of Michigan oil shale - Current field studies 13 p0024 A77-12695
- HUMPHRIES, T. S.  
Corrosion inhibitors for solar heating and cooling systems [NASA-TN-D-8409] 14 p0210 N77-17198
- HUNN, B. D.  
Simulation and cost optimization of solar heating of buildings in adverse solar regions 14 p0180 A77-25897  
Determination of average ground reflectivity for solar collectors 14 p0181 A77-25903  
Determination of average ground reflectivity for solar collectors 16 p0471 A77-48933
- HUNSBEDT, A.  
Recovery of energy from fracture-stimulated geothermal reservoirs 16 p0424 A77-44604
- HUNSUCK, J. D.  
The national laser-fusion program 14 p0168 A77-23502
- HUNT, A.  
Results from circumsolar radiation measurements [LBL-5292] 15 p0382 N77-26657
- HUNT, L. F.  
Solar silicon via improved and expanded metallurgical silicon technology [NASA-CR-153415] 16 p0528 N77-30606
- HUNTER, H. E.  
Effect of mechanical cooling devices on ambient salt concentration [PB-256679/2] 13 p0125 N77-14631
- HUNTER, P. J.  
Land use, energy flow and policy making in society. SIMPAC handbook. A guide to the modeling of socio-economic phenomena [PB-267134/5] 16 p0530 N77-30637
- HUNTER, S. C.  
Control of oxides of sulfur from stationary sources in the south coast air basin of California [PB-261754/6] 15 p0348 N77-22668
- HUNTINGTON, R. A.  
Energy storage - An interference assembled multiring superflywheel 16 p0450 A77-48761
- HUNZINGER, J. J.  
Periodically adjustable concentrators adapted to solar cell panels 13 p0074 A77-19068
- HUNZINGER, J.-J.  
Periodically adjustable concentrators adapted to solar cell panels 14 p0166 A77-23385
- HUQ, R.  
Vortex kinetic energy concentrator 13 p0044 A77-12870
- HURLEY, J. B.  
Technology requirements for advanced earth-orbital transportation systems: Summary report [NASA-CR-2867] 16 p0550 N77-33255
- HURN, R. W.  
The fuel approach to control emissions from aircraft [IAF PAPER 76-111] 13 p0003 A77-10911
- HUSSAIN, S. Q.  
Conductivity of seeded combustion products of acetylene systems 15 p0288 A77-34039
- HUSSEMAN, E.  
Selective behavior and selective layer deposition in the case of light-transparent covers 14 p0202 A77-29564
- HUTTABLE, D. D.  
Thermal energy storage by the sulfuric acid-water system 16 p0492 A77-49108
- HWANG, H. H.  
Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks 15 p0267 A77-32243  
Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks [NASA-TN-X-73613] 14 p0220 N77-19580
- HYACINTHE, J.-L.  
Stratified density solar collection ponds - Physical factors, results of previous investigations, and suggested experiments 16 p0418 A77-42964
- HYDE, R. W.  
Comparative economics for the Arthur D. Little extractive coking process 13 p0022 A77-12684  
Comparative economics for the Arthur D. Little extractive coking process 15 p0301 A77-36340
- IACHETTA, F. A.  
Analysis of thermal performance of 'Solaris' water-trickle solar collector [ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526  
Performance and analysis of 'Solaris' water-trickle solar collector 16 p0472 A77-48939  
Performance and analysis of SOLARIS water-trickle solar collector [CONF-760821-9] 14 p0232 N77-20599  
Analysis of thermal performance of Solaris water-trickle solar collector [CONF-761107-17] 15 p0382 N77-26668  
Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water [CONF-761143-1] 15 p0382 N77-26669
- IAKUSHEV, A. A.  
Shock tube for investigations of high-temperature MHD generators 13 p0054 A77-15665
- IANOVICI, I.  
Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases 14 p0195 A77-28050
- IASTUONO, A.  
Shallow solar ponds for industrial process heat - The ERDA-Sohio project 16 p0482 A77-49024

- A generalized numerical model for predicting energy transfers and performance of large solar ponds  
16 p0482 A77-49025
- LLL-Sohio solar process heat project. Report no. 3: LLL solar energy group  
[UCID-16630-3] 13 p0123 N77-14604
- Shallow solar ponds for industrial process heat: The ERDA-SOHIO project  
[UCL-78288] 14 p0232 N77-20601
- IBRAGIMOV, D. IU.  
Economic effectiveness of solar electric power stations  
13 p0063 A77-17556
- ICERMAN, L.  
Net energy analyses for liquid-dominated and vapor-dominated hydrothermal energy-resource developments  
14 p0194 A77-27351
- ICHIKAWA, S.  
Organic Rankine Cycle Engine development and solar energy utilization  
13 p0077 A77-19096
- IGENBERGS, E.  
Energy storage in orbital and interplanetary missions  
[DGLR PAPER 76-189] 13 p0059 A77-16551
- A new cycle for optimum energy storage in interplanetary missions  
[IAF PAPER 77-141] 16 p0507 A77-51444
- IGNAT, D. W.  
Neutral beam energy and power requirements for the next generation of tokamaks  
[ERDA-76-77] 14 p0213 N77-17883
- IGNATIEV, A.  
Particulate nature of solar absorbing films - Gold black  
14 p0163 A77-22982
- IGNATIUS, R.  
On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices  
16 p0488 A77-49073
- IGOU, R. D.  
Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays  
[NASA-CN-149451] 13 p0106 N77-12524
- IGRA, O.  
Compact shrouds for wind turbines  
16 p0416 A77-42891
- IHARA, S.  
Feasibility of hydrogen production by direct water splitting at high temperature  
15 p0279 A77-33372
- Feasibility of hydrogen production by direct water splitting at high temperature  
14 p0240 N77-21606
- IKEDA, S.  
Experiment on MHD generator with a large-scale superconducting magnet /ETL Mark V/  
13 p0049 A77-13728
- Experiment on MHD generator with a large scale superconducting magnet /ETL Mark V/  
15 p0325 A77-39527
- IKESAKI, S.  
Ceramic thin film CdTe solar cell  
14 p0135 A77-19635
- IKUTA, T.  
Concept of a fusion burner  
13 p0061 A77-17014
- ILES, P. A.  
Research, development and pilot production of high output thin silicon solar cells  
[NASA-CN-149858] 14 p0219 N77-19573
- ILJAS, J.  
Nuclear power aspects in an oil and coal producing country  
[IAEA-CN-36/175] 16 p0560 N77-33681
- ILLIG, R. G.  
Catalytic coal liquefaction using synthesis gas  
13 p0059 A77-16473
- ILYIN, Y. A.  
Operation peculiarities of low temperature heat pipes with crimped capillary structure  
13 p0119 N77-14380
- Investigations of nonsteady-state processes at cryogenic heat pipe operation  
13 p0119 N77-14384
- IMAI, K.  
Development of electric vehicles at Toyota  
14 p0161 A77-22904
- IMAHURA, M. S.  
Definition study for photovoltaic residential prototype system  
[NASA-CN-135056] 13 p0113 N77-13533
- IMAMUTDINOV, F. M.  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method  
[BIL-M-25448-(5828.4F)] 13 p0112 N77-13235
- IMARISIO, G.  
The compatibility of containment materials for thermochemical hydrogen production  
15 p0276 A77-33347
- INBEET, B.  
Focusing collectors of solar radiation  
14 p0150 A77-21808
- INGLEY, H. A.  
Experimental evaluation of the University of Florida solar powered ammonia/water absorption air conditioning system  
13 p0039 A77-12823
- Continuous solar air conditioning with ammonia/water absorption cycle  
14 p0182 A77-26057
- A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House  
14 p0182 A77-26058
- A self-contained solar powered tracking device  
[ASME PAPER 76-WA/HT-26] 14 p0186 A77-26477
- The University of Florida solar house  
15 p0294 A77-35317
- INGLIS, H.  
Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10090] 14 p0214 N77-18511
- INGRAM, B. R.  
Effects of thermal pollution on certain aquatic invertebrates  
[PB-263488/9] 15 p0368 N77-24673
- INGRAM, H. M.  
Role of the heat storage well future U.S. energy systems  
[PB-263480/6] 15 p0367 N77-24634
- INMAN, R. E.  
Energy from agriculture  
15 p0314 A77-37664
- Silviculture energy plantations  
16 p0488 A77-49079
- INOUE, S.  
Dynamic characteristics of the desulfurization plant boiler draft system for power stations  
15 p0338 A77-40201
- INTERESS, E.  
Comparison of coal conversion processes for electric power generation  
14 p0192 A77-27288
- The relative advantages of coal conversion routes for electric power generation  
15 p0300 A77-36330
- IQBAL, K. Z.  
The use of mixture working fluids in geothermal binary power cycles  
16 p0455 A77-48802
- Sensitivity analysis for OTEC propane and mixture cycles  
16 p0485 A77-49047
- Resource utilization efficiency improvement of geothermal binary cycles, phase 1  
[ORO-4944-3] 13 p0123 N77-14600
- IRBY, J. E.  
Long term performance prediction of residential solar energy heating systems  
13 p0039 A77-12822
- Unified simulation capability for solar heating and cooling system analysis  
16 p0479 A77-49003
- IRESON, A. T.  
Soluble-salt processes for in-situ recovery of hydrocarbons from oil shale  
16 p0441 A77-48472
- IRETON, V. H.  
Solar heating and cooling in a commercial building  
16 p0477 A77-48983



- IRICK, P. E.  
TRISNET. Directory to transportation research  
information resources  
[PB-255172/9] 13 p0125 N77-14939
- IRWIN, S. E.  
Performance and cost analysis of photovoltaic  
power systems for on-site residential applications  
13 p0038 A77-12816
- ISAEV, A. V.  
Effect of nitrogenous bases on the thermal  
stability of jet fuels  
[NASA-TN-75131] 15 p0388 N77-27243
- ISARD, W.  
Regional economic impacts of nuclear power plants  
[BNL-50562] 16 p0540 N77-31676
- ISENHOUR, T. L.  
Fuel cells and solid electrolytes  
[AD-A033782] 15 p0366 N77-24630
- ISEROV, A. D.  
Processing of experimental data with the U-25  
facility with the aid of a data measuring system  
15 p0269 A77-32521
- ISHIDA, Y.  
An analysis on optimal design of solar heating and  
cooling system for school 16 p0477 A77-48984
- ISHIKAWA, M.  
Two-dimensional analysis of end effects in  
diagonal type nonequilibrium plasma MHD generator  
15 p0297 A77-36097  
A study of the effects of new transportation  
systems on urban transportation and environment  
by computer simulation 16 p0430 A77-46652
- ISHIWATARI, M.  
Thermal alteration of young kerogen in relation to  
petroleum genesis 13 p0053 A77-15044  
Thermal alteration experiments on organic matter  
from recent marine sediments in relation to  
petroleum genesis 15 p0298 A77-36254
- ISHIWATARI, R.  
Thermal alteration of young kerogen in relation to  
petroleum genesis 13 p0053 A77-15044  
Thermal alteration experiments on organic matter  
from recent marine sediments in relation to  
petroleum genesis 15 p0298 A77-36254
- ISLEB, R. J.  
Hydrogen storage via iron-titanium for a 26 MW/e/  
peaking electric plant 13 p0048 A77-13543
- ISHANZHANOV, A. I.  
Contribution to procedures for testing Silazan  
resin coatings 16 p0443 A77-48522
- ISOKBARI, O. F.  
Proceedings of Second Geopressed Geothermal  
Energy Conference. Volume 3: Reservoir  
Research and Technology  
[CONF-760222-P3] 14 p0249 N77-21678  
Numerical simulation of United States Gulf Coast  
geothermal geopressed reservoirs 16 p0545 N77-32585
- ISSELHARDT, C. F.  
Summary of 1976 geothermal drilling - Western  
United States 15 p0286 A77-33522
- ISSHIKI, M.  
Energy conversion and storage by CDE  
/concentration difference energy/ engine and  
system 16 p0459 A77-48831
- ITA, L. E.  
Study of a solar assisted diffusion separation  
process for isotopic mixtures 16 p0483 A77-49030
- ITOH, K.  
Concept of a fusion burner 13 p0061 A77-17014
- ITOH, T.  
A study of the effects of new transportation  
systems on urban transportation and environment  
by computer simulation 16 p0430 A77-46652
- ITOH, L. E.  
Hydrogen atoms: Rare earth ions: Magnetic  
resonance studies on polycrystalline solids and  
surface systems relevant to catalysis and other  
energy-related research 13 p0117 N77-13798
- IURA, T.  
Research plan for achieving reduced automotive  
energy consumption  
[PB-255929/2] 13 p0121 N77-14495
- IURIN, E. E.  
Some questions concerning the creation of a solar  
thermionic converter system 15 p0315 A77-37765  
Some problems involved in the development of a  
solar thermionic power plant 16 p0436 A77-47421
- IURKEVICH, I. B.  
Investigation of energy parameters of  
low-temperature ring thermopiles 16 p0409 A77-41902
- IVANOV, B. I.  
Ignition of a pulsed thermonuclear reaction by  
high-current ion beams 14 p0164 A77-23106
- IVANOV, I. I.  
Economics and organization of metallurgical  
production: Effectiveness of the use of  
magnetic fields in melting alloy steels  
[BLL-M-25473-(5828.4F)] 15 p0359 N77-24245
- IVANOV, P. P.  
Influence of various losses on the characteristics  
of high-power MHD generators 13 p0046 A77-13258  
Effect of various losses on the characteristics of  
powerful MHD generators 15 p0263 A77-31538
- IVANOV, R. S.  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- IVANOVSKIY, M. I.  
Operation peculiarities of low temperature heat  
pipes with crimped capillary structure 13 p0119 N77-14380  
Investigations of nonsteady-state processes at  
cryogenic heat pipe operation 13 p0119 N77-14384
- IVANOVSKIY, M. M.  
Some features of start-up of alkali metal heat pipes  
13 p0119 N77-14383
- IVIRS, R. O.  
Design and testing of lithium/iron sulfide  
batteries for electric-vehicle propulsion  
14 p0161 A77-22910  
Design and performance of Li-Al/iron sulfide cells  
for utility energy storage and electric vehicles  
[CONF-760617-3] 16 p0535 N77-31618
- IWABUCHI, S.  
A new design for the high-performance  
sodium-sulfur battery  
[SAE PAPER 770281] 16 p0424 A77-44564
- IWASA, Y.  
Superconducting magnet development for the MHD  
program 15 p0331 A77-39569
- JACKSON, A. H.  
Multi-mission uses for prop-fan propulsion  
15 p0339 N77-22127
- JACKSON, D. H.  
The SRC-II process 14 p0192 A77-27292
- JACKSON, J.  
Historical patterns of residential and commercial  
energy uses 15 p0298 A77-36244
- JACKSON, J. W.  
A bioenvironmental study of emissions from refuse  
derived fuel  
[AD-A024661] 13 p0110 N77-12571  
Waste POL disposal through energy  
recovery [AD-A031783] 14 p0235 N77-20957
- JACKSON, E. W.  
Exhaust and evaporative emission from a Brazilian  
Chevrolet fueled with ethanol-gasoline blends  
16 p0444 A77-48708

- JACKSON, P. S.  
Aspects of surface wind behaviour 14 p0165 A77-23357
- JACKSON, W. D.  
MHD power generation - 1976 Status Report 13 p0033 A77-12782  
Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility 14 p0139 A77-21215  
Development of a baseline reference design for an open cycle MHD power plant for commercial service 14 p0140 A77-21232  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility 14 p0142 A77-21257  
Status of the reference dual-cycle MHD-steam power plant 15 p0332 A77-39577  
Design of the Montana Magnetohydrodynamics Component Development and Integration Facility 16 p0458 A77-48822
- JACOB, K. T.  
Some studies on a solid state sulfur probe for coal gasification systems [NASA-TM-78428] 16 p0534 A77-31605
- JACOBS, C.  
Benefits of hydrogen production research 13 p0032 A77-12768
- JACOBS, B.  
Direct contact heat exchangers for geothermal power plants 13 p0029 A77-12747
- JACOBS, H. R.  
University of Utah direct contact Geothermal Power Project report. A computer program for determining the thermodynamic properties of water [UTEC-ME-76-171] 15 p0380 A77-26642
- JACOBS, M. E.  
Fuel efficiency improvement in rail freight transportation: Multiple unit throttle control to conserve fuel [PB-262470/8] 15 p0366 A77-24629
- JACOBSON, D. L.  
Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835
- JACOBSON, W. O.  
Study of gasoline vapor emission controls at small bulk plants [PB-267096/6] 16 p0549 A77-32638
- JACQUES, M. T.  
Charge characteristics of particles in coal derived liquids - Measurement and origin 16 p0412 A77-42408
- JAFFE, L. D.  
Applications of aerospace technology to petroleum exploration. Volume 1: Efforts and results [NASA-CR-152694] 15 A77-22741  
Applications of aerospace technology to petroleum exploration. Volume 2: Appendices [NASA-CR-152693] 15 p0351 A77-22742
- JAGUARIBE, E.-F.  
The geometry of catoptric light. II - An application to solar energy 16 p0417 A77-42959
- JAHN, A.  
The test reference year: A collection of hourly values of interesting weather elements. III - Conversion of the air pressure for other altitudes, equations of the vapor pressure of water, calculation of the position of the sun 16 p0441 A77-48258
- JAHNIG, C. E.  
Aviation turbine fuels from shale and coal oils 15 p0291 A77-35150  
A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants 16 p0452 A77-48779  
An environmental assessment of liquid metal topping cycles 16 p0452 A77-48780
- JAIN, A. K.  
The Page-Jackson Elementary School solar heating and cooling system 16 p0462 A77-48851
- JAKOBSSON, S.  
Geothermal flux through palagonitized tephra, Surtsey, Iceland - The Surtsey temperature-data-relay experiment via Landsat-1 13 p0048 A77-13648
- JAMES, L. W.  
GaAs solar cells for very high concentrations 14 p0204 A77-29581
- JAMES, R.  
Thermal efficiency of geothermal power 14 p0205 A77-29788  
Calcite-aragonite deposition in geothermal wells 16 p0418 A77-43025
- JAMES, R. K.  
Analysis of coal particles undergoing rapid pyrolysis 14 p0175 A77-24212  
Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821
- JAMES, R. W.  
Sewage sludge treatment and disposal 15 p0298 A77-36127
- JANETZKE, D. C.  
Dynamic blade loading in the ERDA/NASA 100 kW and 200 kW wind turbines [NASA-TM-73711] 16 p0528 A77-30599
- JANKE, S. H.  
Arrays of fixed flat-plate solar energy collectors - Performance comparisons for differing individual component orientations 13 p0068 A77-18449
- JANKOWSKA, A.  
Multi-stage activation of brown-coal chars with oxygen 16 p0401 A77-41319
- JANOTA, M. S.  
Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio 15 p0293 A77-35186
- JANUSZKIEWICZ, S.  
New materials for fluorosulfonic acid electrolyte fuel cells [AD-A036988] 15 p0380 A77-26640
- JARDINE, D. M.  
Operational report on an integrated solar-assisted optimized heat pump system 14 p0171 A77-23658  
United States special format report: Report of the Phoenix Corporation, city of Colorado Springs Solar Heating Project [SE-4578-76/1] 15 p0373 A77-25647
- JARVINEN, P. O.  
Windowed versus windowless solar energy cavity receivers 13 p0037 A77-12808  
Solar-heated-air receivers 15 p0255 A77-30312  
Heat mirrored solar energy receivers [AIAA PAPER 77-728] 15 p0324 A77-39506  
Photovoltaic applications for the National Park Service 16 p0460 A77-48837
- JARVIS, P. M.  
Compressed air energy storage for electric utility load leveling 16 p0458 A77-48825
- JASTROW, J. D.  
The environmental effects of using coal for generating electricity [PB-267237/6] 16 p0524 A77-29655
- JAUMOTTE, A.  
A combined cycle with a partial-oxidation reactor 13 p0062 A77-17534
- JAUMOTTE, A. L.  
Earth, an open system - The use of solar energy 16 p0432 A77-46788
- JAYADEV, T. S.  
A new generation scheme for large wind energy conversion systems 13 p0043 A77-12868  
Windmills stage a comeback 13 p0048 A77-13624
- JEFFERIS, J. G.  
Evaluation of the potential environmental effects of wind energy system development [ERDA/NSF-07378/75/1] 15 p0382 A77-26663

- JEFFRIES, T. W.**  
Biosolar production of fuels from algae  
[UCRL-52177] 16 p0511 N77-28323
- JEPFS, E.**  
Nova Scotia seeks to cut oil bill for power generation  
13 p0063 A77-17588  
California's aqueduct offers peaking power to Los Angeles  
16 p0400 A77-40893
- JEPFS, E. J.**  
Solar energy prospects grow for US southwest  
15 p0297 A77-36049
- JELINEK, M.**  
Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications  
16 p0450 A77-48756
- JEN, H.**  
Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512
- JENKINS, D.**  
JP-4 and JP-9 fuel toxicity studies using water fish and aufwuchs  
[AD-A027594] 13 p0127 N77-15213
- JENKINS, J. P.**  
Initial test results for a solar-cooled townhouse in the mid-Atlantic region  
14 p0170 A77-23655
- JENKINS, W.**  
Underground gasification offers clean safe route to coal energy  
14 p0184 A77-26292
- JENSEN, C.**  
Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists  
16 p0497 A77-49157
- JENSEN, G. A.**  
Ocean thermal energy conversion opportunities  
[BNWL-SA-5808] 14 p0217 N77-18581  
OTEC annual report to the Division of Solar Energy for FY-1976 and the transition quarter  
[BNWL-2154] 15 p0382 N77-26665
- JENSEN, H. B.**  
Characteristics of synthetic crude from crude shale oil produced by in situ combustion retorting  
14 p0169 A77-23552  
Production of synthetic crude from crude shale oil produced by in situ combustion retorting  
14 p0169 A77-23557
- JENSEN, R. K.**  
Characterization of synthetic liquid fuels  
14 p0169 A77-23554
- JENSEN, R. W.**  
Initial operation of a solar heating and cooling system in a full-scale solar building test facility  
16 p0498 A77-49164  
Solar hot water systems application to the solar building test facility and the Tech House  
13 p0084 N77-10342  
Evaluation of initial collector field performance at the Langley Solar Building Test Facility  
[NASA-TM-X-73677] 15 p0378 N77-26617
- JENSEN, W. P.**  
Geothermal powered heat pumps to produce process heat  
13 p0030 A77-12754
- JENSEN, W. S.**  
An analytical and experimental investigation of a 1.8 by 3.7 meter Fresnel lens solar concentrator  
[NASA-TP-1005] 16 p0529 N77-30617
- JERABER, E. C.**  
Load leveling with electric vehicles in the urban environment  
13 p0024 A77-12701
- JERWELL, L. S.**  
Design of a large span-distributed load flying-wing cargo airplane  
[NASA-TM-X-74031] 15 p0353 N77-23089
- JEWELL, D. M.**  
Characterization of synthetic liquid fuels  
14 p0169 A77-23554
- JEWELL, W. J.**  
Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164] 15 p0383 N77-26675
- JHAWAR, K. R.**  
Thermodynamic analysis of an oil reclamation process  
[PB-268524/6] 16 p0548 N77-32614
- JILEK, R.**  
Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer  
[BLI-SMBE-TRANS-6562-(8313.4)] 15 p0371 N77-25485
- JIRIK, C. J.**  
A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve  
[PB-255948/2] 13 p0105 N77-12500
- JOBIN, W. R.**  
Ecological review of hydroelectric reservoirs in Puerto Rico  
[CEER-1] 16 p0540 N77-31673
- JOEBSTL, J. A.**  
Surface research for development of new electrocatalysts for acid electrolyte fuel cells  
[AD-A026053] 13 p0131 N77-15517
- JOELS, R.**  
OPTIMO - A method for process evaluation applied to the thermochemical decomposition of water  
15 p0320 A77-38526
- JOENSEN, A. W.**  
Environmental effects of solid waste as a supplemental fuel  
[IS-3852] 14 p0211 N77-17567
- JOHANSEN, R. T.**  
Fracturing oil shale with explosives for in situ recovery  
14 p0169 A77-23559
- JOHN, J. E. A.**  
Design of a spherical RTG  
16 p0462 A77-48857
- JOHNES, G. L.**  
Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3  
[PB-268492/6] 16 p0548 N77-32615
- JOHNSON, A. C.**  
Commercialization of solar heating and cooling of buildings  
16 p0496 A77-49142
- JOHNSON, C. A.**  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project  
[ERDA/NSF-00603/75/T1] 14 p0215 N77-18561
- JOHNSON, C. C.**  
Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
13 p0043 A77-12867  
Large windpower systems integrated with existing electric utilities  
16 p0490 A77-49094  
Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
[CONF-760906-8] 14 p0222 N77-19609
- JOHNSON, C. E.**  
Initial generator tests with revised ambient-temperature liquid-metal MHD facility  
15 p0326 A77-39538
- JOHNSON, E. F.**  
Chemical engineering side of nuclear fusion power  
[FPPL-1303] 15 p0376 N77-25965
- JOHNSON, G. G.**  
Energy Conservation Alternatives Study (ECAS), phase 2: Volume 2: Advanced energy conversion systems, - conceptual designs. Part 1: Analytical approach  
[NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results  
[NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635
- JOHNSON, G. R.**  
A data acquisition, performance evaluation and monitoring system for solar heated/cooled residential dwellings  
[ASME PAPER 76-WA/SOL-13] 14 p0189 A77-26518
- JOHNSON, I.**  
Reducing the environmental impact of solid wastes from a fluidized-bed combustor  
16 p0454 A77-48790

- JOHNSON, J. A.  
Photovoltaic system test facility electromagnetic interference measurements  
[NASA-TM-X-73640] 15 p0343 N77-22608  
ERDA/Lewis research center photovoltaic systems test facility  
[NASA-TM-X-73641] 15 p0343 N77-22609
- JOHNSON, J. E.  
Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777  
Titanium alloy hydrides - Their properties and applications 15 p0280 A77-33385
- JOHNSON, L. E.  
Unconventional energy sources  
[PB-268301/9] 16 p0548 N77-32617
- JOHNSON, P. E.  
Geology and potential uses of the geopressure resources of the Gulf Coast  
[UCID-17163] 14 p0215 N77-18562
- JOHNSON, R. E.  
Potential structural material problems in a hydrogen energy system 15 p0281 A77-33389
- JOHNSON, R. L.  
Energy recovery from municipal solid waste, an environmental and safety mini-overview survey  
[ATR-76 (7518)-7] 15 p0369 N77-25011
- JOHNSON, R. N.  
A heat capacitor for MHD electric power generation systems 15 p0331 A77-39571
- JOHNSON, R. T.  
Methanol gasoline blends - Future automotive fuels 15 p0273 A77-33300
- JOHNSON, S. L.  
Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment  
[PB-269270/5] 16 p0561 N77-34058
- JOHNSON, S. M.  
Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161  
Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator  
[NASA-TM-X-73520] 13 p0097 N77-11530  
Standardized performance tests of collectors of solar thermal energy - A flat-plate copper collector with parallel mylar striping  
[NASA-TM-X-73553] 13 p0114 N77-13535  
Standardized performance tests of collectors of solar thermal energy: An evacuated flatplate copper collector with a serpentine flow distribution  
[NASA-TM-X-73415] 13 p0114 N77-13536  
Baseline performance of solar collectors for NASA Langley solar building test facility  
[NASA-TM-X-3505] 15 p0363 N77-24587
- JOHNSON, T. L.  
Design of sodium-cooled, central receiver solar power plant 16 p0461 A77-48843
- JOHNSON, V. E.  
A structural design process for solar energy systems 16 p0480 A77-49012
- JOHNSON, W. A.  
Trends in world oil prices and production  
[PB-268411/6] 16 p0547 N77-32607
- JOHNSTON, P. J. E.  
The future of air transportation - Economic association considerations  
[AIAA PAPER 77-286] 13 p0065 A77-18222
- JOHNSTON, R. P.  
Study of unconventional aircraft engines designed for low energy consumption  
[NASA-CR-135136] 13 p0127 N77-15043
- JOLLEY, J.  
Lightweight reflector assembly  
[NASA-CASE-WFO-13707-1] 16 p0518 N77-28933
- JONES, A. E.  
Air pollution control for industrial coal-fired boilers 16 p0504 A77-51152
- JONES, A. E.  
Approaches to chemical class analyses of fossil derived materials  
[CONF-770301-5] 16 p0532 N77-31271
- JONES, B. D.  
Aspects of energy conversion; Proceedings of the Summer School, Lincoln College, Oxford, England, July 14-25, 1975 13 p0004 A77-11026
- JONES, C. E.  
An economic and performance design study of solar preheaters for domestic hot water heaters in North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- JONES, G. J.  
Development of a small radioisotopic heat source 13 p0042 A77-12852
- JONES, G. H.  
Small space station electrical power system design concepts 13 p0040 A77-12835
- JONES, G. T.  
Development of low cost, high energy-per-unit-area solar cell modules  
[NASA-CR-153977] 16 p0528 N77-30605
- JONES, G., II  
Photon energy storage in organic materials: The case of linked anthracenes  
[AD-A039702] 16 p0535 N77-31615
- JONES, I. W.  
Sodium/sulphur battery development in the United Kingdom 13 p0026 A77-12117  
Sodium/sulphur battery design and development for motive power applications 14 p0161 A77-22905
- JONES, J.  
Energy management for Texas commerce and industry  
[PB-268409/0] 16 p0548 N77-32616
- JONES, K. I.  
Santa Clara, California, community center, commercial solar demonstration legal alternatives, implications, and financing of solar heating and cooling by a municipal corporation  
[SAN/1083-76/1] 15 p0394 N77-27549
- JONES, L. W.  
Perspectives on the evolution into a hydrogen economy 14 p0246 N77-21652
- JONES, H. C.  
Helium research in support of superconducting power transmission  
[PB-265076/0] 15 p0390 N77-27326
- JONES, B. A.  
Auxiliary power system for activity cooled aircraft  
[NASA-CASE-LAR-11626-1] 13 p0103 N77-12332
- JONES, E. G.  
Analysis of state solar energy options  
[PB-254730/5] 13 p0091 N77-10688
- JONES, B. L.  
Proceedings of Second Geopressed Geothermal Energy Conference. Volume 4: Surface technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- JONES, B. W.  
Solar-powered housing unit - Simulation of solar heating and cooling in Saudi Arabia 13 p0078 A77-19110  
A new Chrome Black selective absorbing surface 16 p0406 A77-41585
- JONES, T. E.  
Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- JONES, W. E.  
An analysis of the role of energy in solid waste utilization and disposal 14 p0182 A77-26070
- JONKE, A. A.  
Synthetic additives for SO<sub>2</sub> removal from combustion gas in a fluidized-bed coal combustor 15 p0293 A77-35168  
Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- JONSSON, V. K.  
Geothermal power utilization, present and future 15 p0262 A77-31475
- JOPLING, D. G.  
Perspectives on implementing OTEC power  
[AIAA 77-1024] 16 p0404 A77-41564

- JORDAN, D.  
Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
13 p0043 A77-12867  
Large windpower systems integrated with existing electric utilities  
16 p0490 A77-49094  
Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
[CONF-760906-8] 14 p0222 N77-19609
- JORDAN, J. B.  
Ignition of droplets of liquid fuels solvent extracted from coal  
16 p0508 A77-51588
- JORDAN, J. F.  
Recent progress in low cost CdS-Cu<sub>2</sub>S solar cells  
14 p0147 A77-21781
- JORDAN, P. F.  
Segmented and self-adjusting wind turbine rotors  
16 p0468 A77-48902
- JORDAN, R. C.  
The ASHRAE monograph on applications of solar energy for heating and cooling buildings  
14 p0167 A77-23441
- JOSEPHS, R. H.  
A lightweight solar array study  
[NASA-CR-152676] 15 p0343 N77-22611
- JOSHI, K. K.  
Fluid dynamic energy conversion and transfer processes  
[AD-A040589] 16 p0533 N77-31444
- JOSKOW, P. L.  
The future outlook for U.S. electricity supply and demand  
15 p0286 A77-33496
- JOST, A.  
Emergency power plant of rapid availability for the Berlin-Tegel airport  
13 p0001 A77-10324
- JOUBERT, J. I.  
Kinetics of regeneration of spent seed from MHD power generation systems  
14 p0141 A77-21251
- JOULZARY, B.  
Solar cell array for concentrated sunlight  
16 p0460 A77-48836
- JOY, P.  
Solar heating thermal storage feasibility  
[ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483
- JOYCE, J.  
Molten salt thermal energy storage for utility peaking loads  
16 p0451 A77-48765
- JUANG, Y. J.  
Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions  
14 p0162 A77-22978
- JUDD, D.  
Near-term advanced electric vehicle batteries  
14 p0161 A77-22909
- JUDE, P.  
Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling  
[ASME PAPER 77-GT-2] 14 p0197 A77-28522
- JUNGTGEN, B.  
Nonisothermal hydrogen-induced desulfurization of coal  
15 p0287 A77-33544  
A technical scale gas generator for steam gasification of coal using nuclear heat  
16 p0502 A77-50255
- JUILLERAT, M.  
Miniature applications for photovoltaic generators  
14 p0155 A77-21853
- JUILLET, P.  
Description of a new photoelectrochemical generator  
14 p0150 A77-21812
- JULIN, S. E.  
Supply of liquefied natural gas to the Northeast  
[BNL-50556] 15 p0392 N77-27521
- JUNG, J. C.  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- JURGENSEN, E. P.  
Energy and protein production from pulp mill wastes  
[COO-2983-2] 16 p0557 N77-33645
- JUST, T.  
Recent results in the research area 'energetics' with respect to nonnuclear energy research  
14 p0200 A77-29300
- JUSTI, E. I.  
Corrosion problems related to the employment of aluminum in collector construction  
14 p0202 A77-29566  
Studies into reduction of radiative heat losses of flat plate solar collectors  
16 p0417 A77-42962
- JUSTI, E. W.  
Energy-direct-conversion in solar technology  
14 p0203 A77-29574
- JUSTUS, C. G.  
Wind energy statistics for large arrays of wind turbines - New England and Central U.S. regions  
16 p0490 A77-49091

## K

- KADAMBI, V.  
Analysis of power cycles with centrifugal fluidized bed coal combustion  
16 p0453 A77-48787
- KADI, F. J.  
Assessment and study of existing concepts and methods of cryogenic refrigeration for superconducting transmission cables  
[COO-2552-6] 14 p0214 N77-18352
- KADLEC, E. G.  
The Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories  
16 p0491 A77-49096  
Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories  
[SAND-76-5712] 14 p0223 N77-19616
- KADLEC, P. A.  
Design phase utility analysis for gas turbine and combined cycle plants  
[PB-256665/1] 13 p0115 N77-13553
- KAGAN, M. B.  
Investigation of p-Al/x/Ga/1-x/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra  
14 p0143 A77-21311
- KAHLE, A. B.  
Construction and interpretation of a digital inertia image  
16 p0421 A77-44464
- KAHN, E.  
Investment planning in the energy sector  
[LBL-4474] 13 p0125 N77-14948
- KAISER, S. W.  
Photoassisted electrolysis of water - Conversion of optical to chemical energy  
13 p0021 A77-12666
- KAKABAEV, A.  
Equations for cold production of an absorption refrigerating solar unit  
14 p0137 A77-20397  
Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions  
15 p0286 A77-33435  
Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia  
16 p0427 A77-45548
- KAKAC, S.  
Solar production of hydrogen as a means of storing solar energy  
13 p0075 A77-19072  
Economics of nuclear-electrolytic hydrogen  
15 p0285 A77-33419  
Economics of nuclear - electrolytic hydrogen  
14 p0247 N77-21659
- KAKHRAHANOV, K. S.  
Thermoelectric power of pseudoternary solid solutions  
13 p0014 A77-11917
- KALBERLAN, A.  
A comparison between the primary energy consumption of electric and gasoline powered vehicles  
14 p0159 A77-22885

- KALFADELIS, C. D.  
A preliminary engineering assessment of jet fuel production from domestic coal and shale derived oils  
13 p0023 A77-12690
- Aviation turbine fuels from shale and coal oils  
15 p0291 A77-35150
- An environmental assessment of a 638 MWe molten carbonate fuel cell power plant  
16 p0453 A77-48781
- Evaluation of methods to produce aviation turbine fuels from synthetic crude oils, phase 2, volume 2 [AD-A036190]  
16 p0511 N77-28325
- KALPAYAN, S. B.  
Accelerated heat-aging studies on fluororubber in various media  
15 p0264 A77-31750
- KALSHANER, P.  
Proceedings of an EPRI Workshop on Technologies for Conservation and Efficient Use of Electric Energy. Volume 1: Overview  
14 p0230 N77-20577
- KALIK, P. W.  
Development of procedures for the measurement of fugitive emissions  
15 p0368 N77-24671
- KALININ, B. A.  
Fabrication of solar energy concentrators based on polyurethane foams using new polyol and isocyanate compounds  
15 p0271 A77-32973
- Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators  
15 p0316 A77-37767
- Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators  
16 p0437 A77-47423
- KALININ, V. I.  
Processing of experimental data with the U-25 facility with the aid of a data measuring system  
15 p0269 A77-32521
- KALISCHER, P.  
Solar collectors - Technology and principles of operation  
14 p0197 A77-28676
- Solar collectors - Technology and principles of operation  
15 p0335 A77-39977
- KALISKI, S.  
Explosion compression of plasma up to critical values of thermonuclear microfusion. I, II  
16 p0400 A77-41201
- KALMYKOV, A. A.  
Ignition of a pulsed thermonuclear reaction by high-current ion beams  
14 p0164 A77-23106
- KALT, A.  
The determination of the performance characteristics of solar collectors  
14 p0203 A77-29573
- KANATE, G. S.  
Large-area high-efficiency AlGaAs-GaAs solar cells  
15 p0259 A77-30738
- KANEYAMA, B.  
Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes  
15 p0275 A77-33344
- Effective conversion processes between thermal and chemical energies: Thermodynamic study of multistep water decomposition processes  
14 p0238 N77-21576
- KANINS, B. B.  
Geothermal energy in Hawaii - Hydrothermal systems  
13 p0029 A77-12741
- Legal and public policy setting for geothermal resource development in Hawaii  
15 p0343 N77-22596
- The Hawaii geothermal project, initial phase 2 progress report  
15 p0355 N77-23594
- KANINSKI, B.  
Remote sensing of geothermic activities of the volcanoes Aetna, Stromboli and Vesuv by means of infra-red NOAA-VHRR-satellite data  
13 p0104 N77-12485
- KANINSKY, F. C.  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project  
14 p0215 N77-18561
- KANIYA, B.  
Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy  
15 p0274 A77-33334
- KANNHOLE, G.  
Energy in the household - Comparison of heating costs and prognosis concerning the consumption of energy until 1985  
13 p0015 A77-12059
- KANODY, J. P.  
Fuel gas production via Koppers-Totzek gasification - An economic analysis  
15 p0301 A77-36336
- KANOSHIDA, J.  
Energy conversion and storage by CDE /concentration difference energy/ engine and system  
16 p0459 A77-48831
- KANOTANI, Y.  
Effects of one-sided heat input and removal on axially grooved heat pipe performance  
14 p0135 A77-19887
- Performance gravity-assisted heat pipes operated at small tilt angles  
15 p0311 A77-37263
- KANE, E. L.  
Advanced fuel nuclear reaction feasibility using laser compression. II  
16 p0435 A77-47359
- KANE, R. S.  
Coal gasification combined-cycle pilot plant system analysis  
16 p0446 A77-48724
- KANG, C. C.  
The H-Coal Process  
14 p0192 A77-27289
- KAO, T. T.  
Coal gasification combined-cycle pilot plant system analysis  
16 p0446 A77-48724
- KAPANY, M. S.  
Solar collectors using total internal reflections  
14 p0204 A77-29596
- KAPELIUSHNIKOV, V. M.  
Experimental facility for measuring spatial and energy characteristics of solar concentrators  
14 p0179 A77-25356
- Geometric perfection of matrix polyurethane foam moldings for solar energy concentrators  
15 p0316 A77-37767
- Experimental setup for measuring space and energy characteristics of solar concentrators  
16 p0409 A77-41906
- Investigating the geometric quality of cast polyurethane-foam duplicates for solar-energy concentrators  
16 p0437 A77-47423
- KAPITSA, P. L.  
Global problems and energy  
16 p0425 A77-44688
- Energy and physics  
15 p0386 N77-26916
- KAPLAN, I. R.  
Description of thermal storage sub-system designs for ERDA's 10-MWe Solar Central Receiver Pilot Plant  
14 p0187 A77-26491
- Survey of selective absorber coatings for solar energy technology  
14 p0199 A77-29067
- KAPLAN, I. R.  
Thermal alteration of young kerogen in relation to petroleum genesis  
13 p0053 A77-15044
- Thermal alteration experiments on organic matter from recent marine sediments in relation to petroleum genesis  
15 p0298 A77-36254

- KAPLAN, M. P.**  
Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator 14 p0136 A77-20109  
Investigating the starting modes of the GT-35 gas turbine plant 16 p0426 A77-45324
- KAPLAN, S. I.**  
Summary report: An exploratory study of cost targets for solar electric power plants [ORNL-TM-5787] 16 p0538 N77-31654
- KAPLAN, S. M.**  
High temperature gas turbine engine [FE-1765-8] 13 p0120 N77-14488  
High temperature gas turbine engine component materials testing program [FE-1765-7] 13 p0127 N77-15401
- KAPUSTIANENKO, G. G.**  
Experimental investigation of energy conversion efficiency during the interaction of a conducting-fluid piston with a magnetic field 14 p0204 A77-29618
- KARABUT, A. B.**  
A 2-MW electric arc generator with porous cooling of the interelectrode insert 13 p0049 A77-13831
- KARADY, P.**  
Types of city development, energy supply, and possibilities for optimization 15 p0338 A77-40349
- KARAKI, S.**  
Comparative performance of solar heating with air and liquid systems 16 p0475 A77-48967  
Comparative performance of solar heating with air liquid systems [COO-2868-1] 15 p0383 N77-26676
- KARIN, G. A.**  
Hydrogen as a fuel in compression ignition engines 13 p0071 A77-18932  
An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 15 p0283 A77-33406  
A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 15 p0283 A77-33407  
An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions 14 p0245 N77-21644  
A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 14 p0245 N77-21645
- KARKHECK, J.**  
Technical and economic aspects of potential US district heating systems [BNL-21287] 14 p0232 N77-20594  
Technical and economic feasibility of US district heating systems using waste heat from fusion reactors [BNL-50516] 14 p0232 N77-20606
- KARLIN, J. J.**  
The nuclear spinner for Satcom applications 13 p0041 A77-12838
- KARNAN, V. D.**  
Simulation study of solar heat pump systems 16 p0477 A77-48982
- KARNAUKHOV, A. S.**  
Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies 13 p0018 A77-12361
- KARPUKHIN, V. T.**  
Some results of MBD-laser investigation 15 p0328 A77-39549  
RF oscillations of a plasma in crossed E x H fields 16 p0503 A77-50350
- KARR, C. H.**  
REM - Today's heating and cooling vs. solar energy 13 p0002 A77-10482
- KARRIS, G. C.**  
Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 N77-20616
- KARTVELISHVILI, M. A.**  
Idealization of complex dynamic systems with examples involving electrical energy systems 16 p0434 A77-47331
- KARVELAS, L. P.**  
Impact of fuel properties on jet fuel availability [AD-A029493] 14 p0219 N77-19278
- KASBOHM, E. L.**  
The PUROX System 15 p0315 A77-37671
- KASH, D. E.**  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply 14 p0179 A77-25224  
Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply [PB-263761/9] 15 p0367 N77-24635
- KASHARSKII, E. G.**  
High-power systems with ac generators and inertial storage banks for electrophysical devices 15 p0261 A77-31426
- KASICH-PILIPENKO, I. E.**  
Studies of technological processes by solar energy under cosmic simulated conditions [IAF PAPER 77-54] 16 p0506 A77-51411
- KASPER, S.**  
Coal gasification update 15 p0306 A77-36763
- KAST, H. B.**  
Oil cooling system for a gas turbine engine [NASA-CASE-LEW-12830-1] 15 p0353 N77-23106
- KASTENBERG, W. E.**  
Temperature excursions during loss of magnet coolant accidents with thermalization of energy of large superconducting solenoids 16 p0411 A77-42160
- KATELL, S.**  
Economic comparison of synthetic fuels - Gasification and liquefaction 15 p0300 A77-36329
- KATSON, E.**  
Solar energy: Policy and prospects [PB-267986/8] 16 p0554 N77-33620
- KATZ, A. H.**  
Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere 16 p0464 A77-48875
- KATZ, S.**  
A laboratory evaluation of precoat filtration parameters for the solvent refined coal process 13 p0059 A77-16474
- KATZ, Y.**  
Design considerations for heat recovery system for DD-963 class ship [ASME PAPER 77-GT-106] 14 p0197 A77-28616
- KAU, C. J.**  
Environmental aspects of low Btu gas combustion 16 p0440 A77-48178
- KAUFFMAN, K. W.**  
Thermal energy storage considerations for solar-thermal power generation 13 p0027 A77-12732  
Thermal energy storage for heating and air conditioning 13 p0057 A77-16206  
Design and costs of high temperature thermal storage devices using salts or alloys [ASME PAPER 76-WA/HT-34] 14 p0187 A77-26481  
Thermal energy storage with saturated aqueous solutions 16 p0493 A77-49111
- KAUFMAN, A.**  
Electric energy alternatives appraisal for New York State 16 p0413 A77-42632
- KAUFMAN, W. B.**  
Re-entrant groove heat pipe [AIAA PAPER 77-773] 15 p0312 A77-37280
- KAUN, T. D.**  
Review of electrode designs and fabrication techniques for lithium-aluminum/iron sulfide cells 13 p0025 A77-12713
- KAUPANG, B. H.**  
A new approach to planning with gas turbines [ASME PAPER 77-JPGC-GT-3] 16 p0509 A77-51623

- KAUSHIK, S. C.  
Conductivity of seeded combustion products of acetylene systems 15 p0288 A77-34039  
Ionization instability in non-equilibrium MHD generators 16 p0416 A77-42894
- KAWAHARA, Y.  
Non-equilibrium MHD power generation using non-seeded argon plasma 13 p0004 A77-11022
- KAYLOR, P. B.  
Northeastern utilities are meeting the clean air challenge 16 p0424 A77-44612
- KAYTEN, G. G.  
A view of the future - Constraints and opportunities 16 p0410 A77-41944  
Air transportation beyond the 1980's 13 p0117 A77-13984
- KAYUKAWA, H.  
Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel 15 p0328 A77-39550
- KAZAKEVICH, O. IA.  
Increasing the electrical strength of the interelectrode gap in an MHD generator 16 p0428 A77-46091
- KAZHBERSKI, L. L.  
Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions 14 p0162 A77-22978  
CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567  
CuInSe<sub>2</sub>/CdS thin film solar cells 16 p0486 A77-49062  
Ternary compound thin film solar cells [PB-262536/6] 15 p0374 A77-25662  
Ternary compound thin film solar cells - 1 [PB-265003/4] 15 p0395 A77-27561
- KEAIRNS, D. L.  
Fluidized bed combustion 14 p0192 A77-27290  
Fluidized bed adiabatic combustor power plants - Concepts and comparisons 16 p0453 A77-48784  
Advanced coal gasification system for electric power generation [PB-1514-176] 13 p0088 A77-10653
- KEARNEY, D. W.  
Design considerations for a noncircular Tokamak demonstration plant [GA-A-14C74] 15 p0351 A77-22968
- KEDDY, E. S.  
Heat pipes for fluid-bed gasification of coal - Metallurgical condition of heat pipes after tests in process environment 13 p0031 A77-12764
- KEDI, R. J.  
Low-temperature thermal energy storage [ORNL-TM-5795] 16 p0536 A77-31631
- KEDL, R. J.  
Thermal energy storage for building heating and cooling applications [ORNL-TM-5700] 15 p0344 A77-22617
- KEELING, C. D.  
Atmospheric carbon dioxide variations at the South Pole 13 p0067 A77-18439
- KEENAN, J. D.  
Energy balance for anaerobic digestion 14 p0138 A77-20999  
Fuels via biocconversion 14 p0176 A77-24569
- KEER, L. H.  
Heat extraction from hot dry rock masses [PB-256775/8] 13 p0116 A77-13556  
Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 A77-28609
- KEETON, J. B.  
Experimental polyurethane foam roofing systems [AD-A031046] 14 p0210 A77-17255
- KEILHACKER, M.  
Additional heating and refuelling for the ASDEX divertor Tokamak 16 p0407 A77-41710
- KEITH, P. W., JR.  
Impact of alternative energy forms on public utilities 16 p0525 A77-30275
- KELLEHER, M. D.  
An optimization study of a low thermal potential power system [AD-A031709] 15 p0348 A77-22666
- KELLER, A.  
A solar collector of glass 14 p0148 A77-21792
- KELLER, E.  
Waste economy and recycling: Problems and practice 15 p0273 A77-33303
- KELLER, G. V.  
Heat transport in geothermal systems 14 p0174 A77-24203
- KELLER, J. G.  
Space heating systems new and conventional in the Northwest with emphasis on alternate energy adaptations 13 p0028 A77-12736
- KELLER, M.  
Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations 16 p0428 A77-46250
- KELLER, W. E.  
Applications of superconductivity in electric power systems [LA-UR-76-1998] 15 p0398 A77-27996
- KELLEY, J. B.  
ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- KELLOGG, H. H.  
The role of recycling in conservation of metals and energy 13 p0061 A77-16825
- KELLY, D.  
Direct contact heat exchangers for geothermal power plants 13 p0029 A77-12747
- KELLY, D. A.  
Automotive fuel-saving system with on-board hydrogen generation and injection into I. C. engines 15 p0280 A77-33384  
Automotive fuel saving system with on-board hydrogen generation and injection into IC engines 14 p0242 A77-21618
- KELLY, H. J.  
A possible correlation of the neutron yield to the electromechanic work in Mather-type plasma focus devices 13 p0061 A77-17017
- KELLY, J. J.  
Composite flywheel development [Y-2072] 15 p0388 A77-27194
- KELLY, R. D.  
Our amazing air transportation system /AIAA-SAE William Littlewood Memorial Lecture/ [AIAA PAPER 77-356] 13 p0067 A77-18260
- KELLY, W.  
Evaluation of current surface coal mining overburden handling techniques and reclamation practices [PB-264111/6] 15 p0372 A77-25625
- KELNHOFFER, W. J.  
Energy management guide for light industry and commerce. EPIC energy management series [PB-263121/6] 15 p0356 A77-23616
- KEMP, A. J.  
A structural design process for solar energy systems 16 p0480 A77-49012
- KEMP, W.  
Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449
- KENDALL, J. S.  
Gaseous fuel reactors for power systems 16 p0468 A77-48906
- KENKS, B. B.  
The analysis of subsidence associated with geothermal development. Volume 3: Information bank [PB-263694/2] 15 p0369 A77-24716



- KENNEDY, J. B.**  
The nickel-zinc battery - A viable alternative for vehicle powering  
14 p0160 A77-22894
- KENNEDY, R. A.**  
EPA and ERDA high-temperature/high-pressure particulate control programs  
[PB-266231/0] 16 p0517 N77-28644
- KENSON, R. E.**  
Development of procedures for the measurement of fugitive emissions  
[PB-263992/0] 15 p0368 N77-24671
- KENT, T.**  
Reflection coefficient for a back-surface glass mirror  
16 p0488 A77-49072
- KENTFIELD, J. A. C.**  
The pressure divider - A device for reducing gas-pipe-line pumping-energy requirements  
13 p0028 A77-12735
- KENWARD, M.**  
Potential energy: An analysis of world energy technology  
15 p0264 A77-31825
- KERN, P. J.**  
Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification  
[SAE PAPER 770047] 16 p0424 A77-44557  
Effects of a thermal reactor on the energy efficiency of a turbocharged, stratified charge engine  
[AD-A026059] 13 p0128 N77-15409
- KERR, R. L.**  
Space battery technology for the 1980s  
[AIAA PAPER 77-482] 14 p0172 A77-23902
- KERR, W.**  
The aqueous homogeneous reactor as a source of hydrogen and of process heat  
15 p0274 A77-33329
- KERSLAKE, W. R.**  
Status of SERT 2 thrusters and spacecraft 1976  
[NASA-TM-X-73501] 13 p0083 N77-10149
- KERSTEN, R.**  
The Phillips energy-experimentation house - Results and experience  
15 p0336 A77-39982  
Calculation and optimization of solar-energy systems which provide hot water  
15 p0337 A77-39988
- KESSELRING, P.**  
The consideration of climatic data in the prediction of solar-system performance  
14 p0202 A77-29569
- KESSLER, R.**  
Mark VI MHD generator studies  
15 p0325 A77-39528  
High power density MHD generators  
[AD-A038612] 15 p0397 N77-27983
- KESTER, F. L.**  
Hydrogen storage on highway vehicles - Update '76  
15 p0280 A77-33380  
Hydrogen storage on highway vehicles: Update 1976  
14 p0242 N77-21614
- KETELS, P. A.**  
Assessment application for direct coal combustion  
[PB-263651/2] 15 p0359 N77-24318  
Survey of emissions control and combustion equipment data in industrial process heating  
[PB-263453/3] 15 p0368 N77-24674
- KETLER, C. P.**  
Development status - Binary Rankine cycle waste heat recovery system  
16 p0459 A77-48828
- KETTANI, M. A.**  
Heliotechnique and development; Proceedings of the International Conference, Dhahran, Saudi Arabia, November 2-6, 1975. Volumes 1 & 2  
13 p0072 A77-19043  
Storage of solar energy in the form of potential hydraulic energy  
13 p0075 A77-19078
- KEZIROGLU, T. M.**  
Economics of nuclear - electrolytic hydrogen  
14 p0247 N77-21659
- KHALIL, K. B.**  
Factors affecting the use of solar energy for cooling  
13 p0078 A77-19108
- KHALKEVICH, V. A.**  
Experimental study of accelerating MHD-generator jets with supersonic flow distortion  
15 p0269 A77-32519
- KHALLIEV, KH.**  
Tests of a combined wind and solar power plant under natural conditions  
15 p0294 A77-35415
- KHAN, A. M.**  
Solar retrofit in a large institutional building - An economic analysis  
14 p0176 A77-24500
- KHAN, M. I.**  
Hydel and solar power for Pakistan  
13 p0079 A77-19121
- KHANDURDIEV, A.**  
Equations for cold production of an absorption refrigerating solar unit  
14 p0137 A77-20397  
Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions  
15 p0286 A77-33435  
Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia  
16 p0427 A77-45548
- KHANNA, S. L.**  
A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel  
15 p0283 A77-33407  
A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel  
14 p0245 N77-21645
- KHAZOV, V. M.**  
Structure of the electric field in the near-end space of a cylindrical electrode  
15 p0295 A77-35607
- KHAZZOON, J. D.**  
Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy  
[PB-255696/7] 13 p0100 N77-11561
- KHEIR, M. A.**  
Electric load management and energy conservation  
14 p0137 A77-20685
- KHODZHAEV, A. SH.**  
Radiant-vector distribution in the radiant field of a parabolocylindric concentrator  
13 p0015 A77-11920  
Energetic calculation of the concentrating capacity of paraboloidal facets  
13 p0051 A77-14579  
Concentrating power of spherical facets  
14 p0179 A77-25357  
Energy computation of concentrating capability of paraboloidal facets  
15 p0290 A77-34973  
Analysis of a faceted concentration system  
15 p0316 A77-37769  
Concentrating capability of spherical facets  
16 p0409 A77-41907  
Analyzing multifacet concentrating systems  
16 p0437 A77-47425
- KHOLEVA, M. M.**  
Investigation of p-Al<sub>x</sub>/Ga<sub>1-x</sub>/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra  
14 p0143 A77-21311
- KHONICH, A. S.**  
Formation of sulfuric anhydride and nitrogen oxides in boilers at variable operating modes  
15 p0272 A77-33174
- KHRISTICH, V. A.**  
Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply  
15 p0272 A77-33170
- KHODIAKOV, S. A.**  
Some questions concerning the creation of a solar thermionic converter system  
15 p0315 A77-37765
- KIDDER, R. E.**  
Laser fusion - Capital cost of inertial confinement  
15 p0300 A77-36318

- KIHARA, D. H.  
Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant  
[PB-261564/9] 15 p0349 N77-22684
- KILGORE, W. C.  
International energy evaluation system 15 p0319 A77-38216
- KILGORE, J. D.  
Environmental studies of the St. Louis-Union Electric refuse firing demonstration 15 p0315 A77-37669
- KIM, J. K.  
Factors which maximize the efficiency of Cr-p-Si Schottky /MIS/ solar cells 15 p0288 A77-34103
- KIM, Y. Y.  
An economic model of new crude oil and natural gas supplies in the lower 48 states 16 p0552 N77-33596
- KIMBER, G. M.  
Ignition of droplets of liquid fuels solvent extracted from coal 16 p0508 A77-51588
- KIMURA, K.-I.  
Design and construction of solar space heating and hot water supply systems for experimental multi-family housing 16 p0477 A77-48979
- KIMURA, S.  
A new design for the high-performance sodium-sulfur battery  
[SAE PAPER 770281] 16 p0424 A77-44564
- KING, A. E.  
High power study, superconducting generators  
[AD-A031620] 15 p0342 N77-22408
- KING, C. F.  
Recovery of energy from solid waste - An answer to some of Southern California's problems 14 p0182 A77-26078
- KING, C. H.  
Modeling of electric drive systems for KEW /flywheel/ vehicles 14 p0200 A77-29469
- KING, J. H. H.  
Use of getters in evacuated solar collectors 16 p0487 A77-49069
- KING, J. H.  
Advanced fuel cell technology and applications 16 p0447 A77-48735
- KING, J. H., JR.  
Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment  
[NASA-CR-134955] 15 p0380 N77-26637  
Advanced technology fuel cell program  
[EPRI-EM-335] 15 p0391 N77-27508
- KING, W.  
The Alcoa 655 selective surface for aluminum 16 p0487 A77-49063  
Application of aluminum alloys for solar heating and cooling systems 16 p0487 A77-49068
- KINTNER, E. E.  
The current state and prospects for development of controlled thermonuclear fusion 14 p0157 A77-22537  
Role of fusion as a future power source  
[IAEA-CN-36/428] 16 p0549 N77-32895
- KIPPERMAN, A. H. H.  
Improving MIS silicon solar cells by HF-treatment of the insulating oxide layer 14 p0151 A77-21819
- KIRSCHHOFF, R. H.  
Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project  
[ERDA/NSY-00603/75/T1] 14 p0215 N77-18561
- KIRICHENKO, B. A.  
Optimization of the geometry of switching buses for thermoelements in thermoelectric generators 13 p0052 A77-14951
- KIRILLIN, V. A.  
Some results of an investigation with the U-25 experimental-industrial facility, aimed at raising its parameters to the design level 14 p0136 A77-20105
- KIRILLOV, V. V.  
Effect of nonuniform conductivity in the boundary layer at the electrode wall on local characteristics of an MHD generator with a diagonal electrode configuration and a subsonic stream 13 p0001 A77-10423  
Study of cathode spots in the presence of slag films on the electrodes of an open-cycle MHD generator 13 p0053 A77-15005  
Study of the electrical characteristics of the boundary layer on the metal surfaces in the channels of an open cycle MHD generator 13 p0054 A77-15666  
The influence of the transverse current nonuniformity, caused by current leakages onto the insulating walls of the channel, on the local characteristics of a nonideal MHD generator 15 p0329 A77-39553  
Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator 15 p0329 A77-39554
- KIRK, J. A.  
Flywheel energy storage. I - Basic concepts 15 p0323 A77-39314  
Flywheel energy storage. II - Magnetically suspended superflywheel 15 p0323 A77-39315  
Energy storage - An interference assembled multiring superflywheel 16 p0450 A77-48761
- KIRKPATRICK, A. R.  
Silicon solar cells by high-speed low-temperature processing 15 p0258 A77-30728  
Low energy production processes in manufacturing of silicon solar cells 16 p0486 A77-49055  
Silicon thin film crystallization and solar cell fabrication  
[PB-261715/7] 15 p0348 N77-22670
- KIRKWOOD, C.  
Energy R&D modeling for budgetary decisions 15 p0319 A77-38218
- KIRNSE, D. W.  
Feasibility study of an Integrated Energy/Utility System at the University of Florida 16 p0449 A77-48751
- KIRPICH, A.  
Performance and cost analysis of photovoltaic power systems for on-site residential applications 13 p0038 A77-12816
- KIRSANOV, L. L.  
Processing of experimental data with the U-25 facility with the aid of a data measuring system 15 p0269 A77-32521
- KIRTLBY, J. L., JR.  
Arrature of the MIT-RPPI superconducting generator 14 p0157 A77-22575
- KISPERT, R. G.  
Methane production from solid waste 16 p0434 A77-47218
- KISTLER, C. W.  
Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays  
[NASA-CR-149451] 13 p0106 N77-12524  
Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier  
[PB-266854/9] 16 p0525 N77-30255
- KITTEL, C.  
Optimal tap water heating 15 p0261 A77-31375
- KITTL, E.  
Composite material structures for thermophotovoltaic conversion radiator  
[AD-A026859] 13 p0132 N77-15519
- KIVIAT, F. E.  
Energy recovery from saline water by means of electrochemical cells 13 p0013 A77-11536
- KLABUNDE, K. J.  
Catalytic hydrogenation of solvent-refined lignite to liquid fuels 13 p0008 A77-11243

- KLANN, J. L.  
Analysis of regenerated single-shaft ceramic gas-turbine engines and resulting fuel economy in a compact car  
[NASA-TN-X-3531] 16 p0521 N77-29607
- KLAPAS, D.  
Electric arc power collection for high-speed trains 13 p0060 A77-16594
- KLAPATCH, B. D.  
Solids gasification for gas turbine fuel 100 and 300 Btu gas 13 p0022 A77-12685
- KLASS, D. L.  
Wastes and biomass as energy resources - An overview 15 p0313 A77-37654  
SNG from refuse and sewage sludge by the BIOGAS process 15 p0314 A77-37659
- KLAUSNER, S. Z.  
Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126
- KLEIN, B. W.  
Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game  
[PB-2556(7/4)] 13 p0105 N77-12502
- KLEIN, J.  
Nonisothermal hydrogen-induced desulfurization of coal 15 p0287 A77-33544
- KLEIN, M.  
An analysis of electric vehicle mission, design, energy impact and cost 13 p0024 A77-12700  
Fabrication and testing of large size nickel-zinc cells  
[NASA-CR-135200] 16 p0529 N77-30610
- KLEIN, W.  
High level concentration of sunlight on silicon solar cells 15 p0267 A77-32208
- KLEIN, R. E.  
Techniques for the analysis of total energy and labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- KLEIN, S.  
JP-4 and JP-9 fuel toxicity studies using water fish and aufwuchs  
[AD-A027594] 13 p0127 N77-15213
- KLEIN, S. A.  
Calculation of monthly average insolation on tilted surfaces 16 p0422 A77-44476  
A design procedure for solar air heating systems 16 p0480 A77-49006  
A design procedure for solar air heating systems 16 p0501 A77-50209  
A design procedure for solar heating systems 13 p0128 N77-15485  
Calculation of monthly average insolation on tilted surfaces  
[CONF-760842-15] 15 p0387 N77-27057  
Design procedure for solar air heating systems  
[CONF-760842-14] 16 p0514 N77-28589
- KLEINKAUF, W.  
Solar thermal systems 15 p0304 A77-36449  
Utilization of solar energy  
[ERDA-TR-144] 14 p0216 N77-18572
- KLEINSCHNIGER, B.  
Development of sodium/sulfur-cells 13 p0026 A77-12716  
Some studies on sodium/sulfur cells 13 p0055 A77-15813  
Electrode-connecting material as a central component of high-temperature fuel cells. II - Investigation of selected high-conductivity mixed oxides 13 p0056 A77-15817
- KLEINWACHTER, B.  
Captation and concentration of solar energy 13 p0074 A77-19063
- KLEPEIS, J.  
The disk geometry applied to open cycle MHD power generation - Experiments and theoretical considerations 15 p0325 A77-39531
- KLETT, M. G.  
Development of a baseline reference design for an open cycle MHD power plant for commercial service 14 p0140 A77-21232  
Status of the reference dual-cycle MHD-steam power plant 15 p0332 A77-39577
- KLIMPEK, C.  
Theory of the Schottky barrier solar cell 15 p0266 A77-32116
- KLING, R. L.  
Space solar power - An available energy source 13 p0056 A77-15946  
The space station and space industrialization  
[AAS 76-050] 16 p0430 A77-46633
- KLINICK, V. W.  
Preliminary report on the CTS transient event counter performance through the 1976 spring eclipse season  
[NASA-TN-X-73487] 13 p0083 N77-10116
- KLING, A.  
Variable speed wind turbines for high wind energy conversions 16 p0410 A77-42074
- KLINGELBOEFER, R.  
Additional heating and refuelling for the ASDEX divertor Tokamak 16 p0407 A77-41710
- KLINKENBERG, K.  
The Philips energy-experimentation house - Results and experience 15 p0336 A77-39982
- KLIUCHEVSKII, I. E.  
Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up 13 p0051 A77-14580  
Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant 15 p0291 A77-34974
- KLOSE, R.  
Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096  
Mathematical simulation of the fixed-bed pressurized gasification process 14 p0164 A77-23097
- KLOSTER, H.  
Layout and flight performance of a hypersonic transport /HST/  
[DGLR PAPER 76-198] 13 p0060 A77-16575
- KLUCHER, T. M.  
Sensitivity of solar-cell performance to atmospheric variables. 1: Single cell  
[NASA-CR-2010] 15 p0378 N77-26623  
Sensitivity of solar-cell performance to atmospheric variables. 2: Dissimilar cells at several locations  
[NASA-CR-2010] 15 p0379 N77-26624  
Sensitivity of solar cell performance to atmospheric variables. 1: Single cell 16 p0527 N77-30534
- KLUCHMAN, W. L.  
Energy reduction in cleaning exhausts containing particulates and noxious gases 16 p0414 A77-42740
- KLUMB, D. L.  
Union Electric Company's 8000 ton per day solid waste utilization system 15 p0313 A77-37656
- KLUPPEL, R. P.  
Performance of an annular cylindrical solar collector 13 p0073 A77-19059
- KLYCHEV, S. I.  
Radiative heat transfer in cavity type axisymmetric collectors for high-temperature solar energy plants 16 p0443 A77-48523
- KNAGG, J. A.  
Estimating procedures associated with aircraft modifications  
[SAWE PAPER 1101] 13 p0016 A77-12181

- KNAPPE, B. M.**  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3] 14 p0249 N77-21678
- KNAPPE, V.**  
The question of the utilization of geothermal energy in dry rocks /dry walls/ 15 p0303 A77-36348
- KNAPPE, W. D.**  
Photovoltaic system test facility electromagnetic interference measurements [NASA-TN-X-73640] 15 p0343 N77-22608  
ERDA/Lewis research center photovoltaic systems test facility [NASA-TN-X-73641] 15 p0343 N77-22609
- KNAUSS, G. L.**  
The 275 deg C microcircuitry: Resistors, capacitors, conductors, substrates, and bonding [SAND-76-0611] 15 p0389 N77-27312
- KNAUTH, B.**  
Path of development and developmental status of the lignite high-temperature coking process in the DDR - An example of effective utilization of lignite as energy vehicle 14 p0163 A77-23096
- KNECHTLI, R. C.**  
Large-area high-efficiency /AlGa/As-GaAs solar cells 15 p0259 A77-30738
- KNIBBIEH, B., JR.**  
PCB emissions from stationary sources: A theoretical study [PB-262650/1] 15 p0367 N77-24665
- KNIGHT, C. E.**  
Composite flywheel development [Y-2072] 15 p0388 N77-27194
- KNIZIA, K.**  
Improvements in energy conversion technology 16 p0505 A77-51154
- KNOCHE, K. P.**  
Hydrogen production using nuclear heat 13 p0057 A77-16211  
Entropy production, efficiency, and economy in the case of the thermochemical production of synthetic fuels - The sulfuric acid-hybrid process for thermochemical water decomposition 14 p0145 A77-21544  
Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur-families 15 p0275 A77-33342  
Balance and optimization procedure for thermochemical cycles for hydrogen production 15 p0276 A77-33345  
Irreversibilities, heat penalties, and economics for the methanol/sulfuric acid process 16 p0457 A77-48814  
Feasibility studies of chemical reactions for thermochemical water splitting cycles of the iron-chlorine-, iron-sulfur- and manganese-sulfur families 14 p0238 N77-21572
- KNOLL, J. E.**  
Determination of hydrogen sulfide in refinery fuel gases [PB-268240/9] 16 p0543 N77-32277
- KNOLL, R. H.**  
Initial operation of a solar heating and cooling system in a full-scale solar building test facility 16 p0498 A77-49164  
Baseline performance of solar collectors for NASA Langley solar building test facility [NASA-TN-X-3505] 15 p0363 N77-24587  
Evaluation of initial collector field performance at the Langley Solar Building Test Facility [NASA-TN-X-73677] 15 p0378 N77-26617
- KNOWLES, G. R.**  
Experimental evaluation of a cylindrical parabolic solar collector [ASME PAPER 76-WA/HT-13] 14 p0186 A77-26473
- KNOX, J. B.**  
Status report: Lawrence Livermore Laboratory wind energy studies [UCID-17157-1] 14 p0221 N77-19588
- KNOX, R. R.**  
Transportation programming, economic analysis, and evaluation of energy constraints [PB-262878/2] 15 p0370 N77-25018
- KNUDSEN, C. W.**  
Economic evaluation by ERDA of alternative fossil energy technologies 15 p0300 A77-36328
- KNUTSEN, C. A.**  
Economics of geothermal electricity generation from hydrothermal resources [BNWL-1989] 13 p0123 N77-14602
- KNY, K.**  
The conservation of air purity and its effect on the energy economy 13 p0049 A77-13811
- KO, S. H.**  
Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy 16 p0449 A77-48750
- KOBAYASHI, R.**  
Effects of devolatilization kinetics and ash behavior on coal fired MHD combustor design 14 p0141 A77-21248
- KOCH, H.**  
Status of development and application of gas-stabilized heat-pipe radiators [DGLR PAPER 76-192] 13 p0060 A77-16557
- KOCHAROV, G. E.**  
Combined studies of the sun and isotope ecology 15 p0271 A77-32868
- KODAMA, Y.**  
Concept of a fusion burner 13 p0061 A77-17014
- KOHLER, M.**  
High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591
- KOHNKE, R.**  
The cylindrical parabolic mirror as reflector for solar collectors. Efficiencies and optimization [DLR-PB-76-55] 14 p0233 N77-20607  
The cylindrical parabolic mirror as reflector for solar collectors-efficiencies and optimization [ESA-TT-365] 15 p0365 N77-24615
- KOENIGSHOFER, D. R.**  
Freeze protection for solar collectors 15 p0303 A77-36350
- KOENING, D. R.**  
Heat pipe nuclear reactor for space power 13 p0036 A77-12797
- KOESTER, J. K.**  
In-channel observations on coal slag 14 p0139 A77-21222  
Electrical behavior of slag coatings in coal-fired MHD generators 15 p0328 A77-39551  
An experimental investigation of fluctuating properties within a combustion MHD generator 15 p0330 A77-39559
- KOH, C. K.**  
Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia 14 p0153 A77-21840
- KOHAN, S. M.**  
Clean energy from Alaskan coals 15 p0301 A77-36333  
Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7] 15 p0361 N77-24504  
Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system [PB-262513/5] 15 p0361 N77-24505
- KOHL, A. L.**  
Low-Btu gasification of coal by Atomics International's molten salt process 13 p0023 A77-12687
- KOHL, J.**  
Conference proceedings, Energy from the Oceans, Fact or Fantasy [PB-256093/6] 13 p0108 N77-12547
- KOHLMUELLER, B.**  
Anodic oxidation of ethylene glycol with noble metal alloy catalysts 15 p0260 A77-31171

- KOHN, S. T.**  
Hybrid simulation of fuel cell power conversion systems  
16 p0414 A77-42636
- KOK, B.**  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-261910/4]  
15 p0350 N77-22688  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-267937/1]  
16 p0554 N77-33619
- KOKHOVA, I. I.**  
Potentialities of electric energy production by means of thermoelectric generators  
14 p0154 A77-21847
- KOKLIEV, G. A.**  
Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters  
13 p0058 A77-16324
- KOLAND, C.**  
Economic and institutional rationale for solar retrofitting - Case example: 'Project Sunshower'  
16 p0495 A77-49131
- KOLBA, V. M.**  
Design and testing of lithium/iron sulfide batteries for electric-vehicle propulsion  
14 p0161 A77-22910  
The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery  
16 p0446 A77-48726
- KOLBEN, H.**  
Experience with a one stage variable geometry axial turbine  
15 p0340 N77-22143
- KOLGOTIN, P. F.**  
Operation peculiarities of low temperature heat pipes with crimped capillary structure  
13 p0119 N77-14380
- KOLN, K.**  
Evaluation of wind-energy sites from aeolian geomorphologic features mapped from LANDSAT imagery. First results [ERDA/NSF-00598/75/T1]  
14 p0218 N77-18667
- KOLOMOETS, N. V.**  
Optimization of the geometry of switching buses for thermoelements in thermoelectric generators  
13 p0052 A77-14951
- KOLTUN, H. H.**  
Use of transparent heat reflecting coatings in solar energy converters  
15 p0285 A77-33430  
Utilization of transparent heat-reflecting coatings in solar-energy converters  
16 p0426 A77-45543  
Effectiveness of heat-emitting coatings with variable degree of blackness  
13 p0111 N77-12893
- KONAREK, P.**  
Applications of superconducting magnets to energy with particular emphasis on fusion power  
16 p0411 A77-42161
- KON, T.**  
Electrical and thermal instabilities in the electrode surface region in a combustion MHD generator channel  
15 p0328 A77-39550
- KONDO, W.**  
The calcium-iodine cycle for the thermochemical decomposition of water  
15 p0275 A77-33340
- KONONENKO, G. M.**  
A generalized indicator characterizing the hydrodynamics and heating efficiency of subterranean thermal circulation systems  
13 p0058 A77-16306  
Liquid flow pattern in extraction of geothermal energy  
14 p0135 A77-19706
- KONOPKA, A.**  
Energy transmission from ocean thermal energy conversion plants  
13 p0032 A77-12773  
Ocean thermal energy delivery systems based on chemical energy carriers  
15 p0279 A77-33375  
Commodity hydrogen from off-peak electricity  
15 p0283 A77-33403
- Ocean thermal energy delivery systems based on chemical energy carriers  
14 p0240 N77-21609  
Commodity hydrogen from off-peak electricity  
14 p0245 N77-21641
- KONOPKA, A. J.**  
Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock  
14 p0200 A77-29437
- KOOSER, J.**  
Analysis of the California energy industry [LBL-5928]  
16 p0557 N77-33640
- KOPACH, E. N.**  
The possibility of using regression models for calculating the effect of weather conditions on electric energy demand  
16 p0411 A77-42259
- KOPELMAN, J. B.**  
Some impacts of restricting nuclear energy availability  
16 p0415 A77-42857  
Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7]  
15 p0361 N77-24504  
Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system [PB-262512/5]  
15 p0361 N77-24505
- KOPITOV, V. F.**  
Ways of improving fuel utilization in industry  
15 p0265 A77-31935
- KORANYI, G.**  
Air cleanup and energy management  
13 p0010 A77-11302
- KORDUS, A.**  
Curve of current delivered from MHD generator to a conventional power grid by inverter system  
14 p0141 A77-21253
- KORENS, M.**  
Low-Btu gas from coal has many potential markets  
14 p0165 A77-23309
- KORIAGIN, M. I.**  
Development and testing of solar water-heating boilers manufactured by diffusion welding  
15 p0316 A77-37773  
Development and testing of solar water-heater boilers fabricated by diffusion welding  
16 p0437 A77-47429
- KORIAGINA, G. M.**  
Influence of various losses on the characteristics of high-power MHD generators  
13 p0046 A77-13258  
Effect of various losses on the characteristics of powerful MHD generators  
15 p0263 A77-31538
- KORNEEV, V. I.**  
Operation peculiarities of low temperature heat pipes with crimped capillary structure  
13 p0119 N77-14380  
Investigations of nonsteady-state processes at cryogenic heat pipe operation  
13 p0119 N77-14384
- KORNEGAY, P. C.**  
The environmental effects of using coal for generating electricity [PB-267237/6]  
16 p0524 N77-29655
- KORNEICH, D.**  
Legal and public policy setting for geothermal resource development in Hawaii [PB-262910/3]  
15 p0343 N77-22596
- KORNRUMPF, W. P.**  
Definition study for photovoltaic residential prototype system [NASA-CR-135039]  
13 p0113 N77-13532
- KOROKENKO, P. V.**  
Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser  
15 p0289 A77-34221
- KOROLEV, N. M.**  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- KOROPHY, O. B.**  
Effects of exhaust manifold configuration on a turbocharged engine employing charge stratification [SAE PAPER 770047]  
16 p0424 A77-44557

- Effects of a thermal reactor on the energy efficiency of a turbocharged, stratified charge engine  
[AD-A026059] 13 p0128 N77-15409
- KORSGAARD, V.  
Dimensioning of the solar heating system in the Zero Energy House in Denmark 15 p0256 A77-30319
- KORSHUNOV, V. N.  
A 2-MW electric arc generator with porous cooling of the interelectrode insert 13 p0049 A77-13831
- KORYCINSKI, P. P.  
Some early perspectives on ground requirements of liquid hydrogen air transports 15 p0281 A77-33391  
The liquid hydrogen option for the subsonic transport - A status report 16 p0458 A77-48819  
Some early perspectives on ground requirements of liquid hydrogen air transports 14 p0243 N77-21628
- KORZH, P. I.  
Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator 14 p0136 A77-20109  
Investigating the starting modes of the GT-35 gas turbine plant 16 p0426 A77-45324
- KOSKINAS, G. J.  
Pyrolysis of oil shale: The effects of thermal history on oil yield [UCRL-77831] 13 p0129 N77-15499
- KOSKY, P. G.  
Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737
- KOST, R.  
Improving automobile fuel economy with advanced transmissions 16 p0444 A77-48704
- KOSTOMOV, A. G.  
Investigation of the thermophysical characteristics of low-temperature heat pipes with metal-fiber wicks 13 p0050 A77-14321  
Structural heat conductivity of fiber metal wicks for heat pipes 13 p0050 A77-14326
- KOUBA, C. C.  
High power study, superconducting generators [AD-A031620] 15 p0342 N77-22408
- KOUO, H. I.  
Assessment application for direct coal combustion [PB-263651/2] 15 p0359 N77-24318
- KOUTSANDREAS, J. D.  
Tracking pollutants from a distance 13 p0067 A77-18370
- KOUTSOHERAS, W.  
Natural convection phenomena in inclined cells with finite side-walls - A numerical solution 16 p0500 A77-50201
- KOUVALIS, A.  
Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany [ANL-ES-50] 15 p0365 N77-24612
- KOVALEV, V. N.  
Testing the annular combustor of the NK-8 aero-engine on natural gas 16 p0426 A77-45325
- KOVARIK, M.  
Optimal control of flow in low temperature solar heat collectors 13 p0019 A77-12409
- KOVASIUK, V. I.  
Influence of various losses on the characteristics of high-power MHD generators 13 p0046 A77-13258  
Effect of various losses on the characteristics of powerful MHD generators 15 p0263 A77-31538  
Investigation of two-dimensional electric effects in a sectional MHD-channel 15 p0317 A77-37930
- KOVITZ, A. A.  
Interfacial effects in the recovery of residual oil by displacement: Studies at Northwestern University [COO-0019-5] 13 p0122 N77-14595
- KOWSZUK, Z.  
Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3 [PB-268492/6] 16 p0548 N77-32615
- KOZAWA, A.  
Rechargeable batteries in Japan 16 p0431 A77-46783
- KOZLOV, V.  
Use of solar water-heating installations in the combined cycle of a thermal electric power plant 14 p0152 A77-21825
- KRAEMER, G.  
Traction batteries for existing and future electric road vehicles 14 p0159 A77-22878
- KRAEMER, S. P.  
Solar shade control - New law for a new technology 15 p0306 A77-36764
- KRAMMER, B.  
Layout and flight performance of a hypersonic transport /HST/ [DGLR PAPER 76-198] 13 p0060 A77-16575
- KRAN, A.  
Alternative strategies for implementing silicon-ribbon technology for photovoltaic applications 13 p0039 A77-12819  
Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149815] 14 p0227 N77-19898  
Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149814] 14 p0227 N77-19899
- KRASINA, E. A.  
Effect of solar-radiation density and angular size of radiation source on efficiency of solar power plants 14 p0143 A77-21312
- KRASNOVSKII, A. A.  
Chemical evolution of photosynthesis 13 p0071 A77-18898
- KRAUS, E. P.  
Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis [NASA-CR-137923] 15 p0353 N77-23072
- KRAUSE, P. E.  
Prerequisites for military/civilian geopressed geothermal resource development 13 p0031 A77-12761
- KRAUSE, H.  
Electric power supply in the case of airports. I 13 p0061 A77-16742
- KRAUSE, H. H.  
Combustion additives for pollution control: A state-of-the-art review [PB-264068/8] 15 p0359 N77-24316
- KRAUSS, O.  
Application study of wind power technology to the city of Hart, Michigan [COO-2603-1] 14 p0212 N77-17582
- KREBS, K.  
Photovoltaic conversion of solar energy using optical concentration systems 14 p0154 A77-21849
- KREID, D. K.  
Technical and economic feasibility analysis of the no-fuel compressed air energy storage concept [BNWL-2065] 14 p0225 N77-19643
- KREIDER, J. F.  
Performance of two fixed-mirror solar concentrators for process heat 13 p0074 A77-19065  
Experimental evaluation of a stationary spherical reflector tracking absorber solar energy collector [ASHE PAPER 76-WA/HT-10] 14 p0186 A77-26470
- KREIBIN, L. B.  
Influence of doped-layer parameters on photoelectric characteristics of silicon photovoltaic cells 13 p0014 A77-11916

- KREITER, B. G.**  
Energy recovery from municipal and industrial waste  
15 p0305 A77-36605
- KREITH, F.**  
An engineering feasibility study of using low  
temperature geothermal sources in Colorado  
13 p0031 A77-12762  
Experimental evaluation of a stationary spherical  
reflector tracking absorber solar energy collector  
[ASME PAPER 76-WA/HT-10] 14 p0186 A77-26470
- KREIBELER, A.**  
Solar-powered housing unit - Simulation of solar  
heating and cooling in Saudi Arabia  
13 p0078 A77-19110
- KREINZ, J. H.**  
Energy: Conversion and utilization  
13 p0052 A77-14957  
Energy and the economy - An interrelated perspective  
15 p0298 A77-36243
- KRESSEL, H.**  
Epitaxial silicon technology for low-cost solar  
cells  
[PB-262396/5] 15 p0374 N77-25663
- KRIKORIAN, O. H.**  
Reactions in the ZnSe thermochemical cycle for  
hydrogen production  
14 p0178 A77-24854  
Recent developments in the engineering and  
chemistry of the ZnSe thermochemical hydrogen  
cycle  
16 p0457 A77-48815
- KRIWK, G.**  
The law for saving energy and its significance for  
energy politics  
15 p0261 A77-31372
- KRISHNA, M.**  
Research on solar energy storage subsystems  
utilizing the latent heat of phase change of  
paraffin hydrocarbons for the heating and  
cooling of buildings  
[PB-254665/3] 13 p0091 N77-10689
- KRISHNASWAMY, P. R.**  
Transfer function analysis of heat pipes  
13 p0119 N77-14385
- KRITCHMAN, E.**  
Solar cell array for concentrated sunlight  
16 p0460 A77-48836
- KROEGER, G.**  
Experimental investigation on a direct coal-fired  
MHD generator  
14 p0141 A77-21238
- KROEGER, E. J.**  
Methane production through bioconversion of  
agriculture residues  
16 p0489 A77-49081
- KROHN, P. F. W.**  
Fabrication and assembly of large composite  
structures in space  
[AIAA PAPER 77-543] 15 p0266 A77-32065
- KROLICZEK, E. J.**  
Application of heat pipes to ground storage of  
solar energy  
[AIAA PAPER 77-729] 15 p0324 A77-39507  
Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512
- KROHS, A.**  
Underground fuel gasification  
[ICRL-TRANS-10998] 13 p0088 N77-10659
- KRONG, U.**  
Manufacturing and evaluation of phthalocyanines as  
catalysts for fuel cells  
[BMFT-FB-T-76-25] 13 p0114 N77-13540
- KROOS, K. A.**  
Design of a spherical BTG  
16 p0462 A77-48857
- KROPOTKIN, M. A.**  
Use of a carbon dioxide laser in remote detection  
of petroleum oil pollution at sea  
16 p0433 A77-47080
- KROWECH, R. J.**  
Circumferential variations of bore heat flux and  
outside surface temperature for a solar  
collector tube  
16 p0429 A77-46426
- KRUEGER, E. C.**  
KIPS - Kilowatt Isotope Power System  
13 p0041 A77-12837
- KRUGER, C. H.**  
Boundary layer measurements of temperature and  
electron number density profiles in a combustion  
MHD generator  
15 p0288 A77-33710  
Axial field limitations in MHD generators  
15 p0328 A77-39552  
Comparison of measurements and predictions of the  
fluid mechanics and thermal behavior of MHD  
channel slag layers  
15 p0330 A77-39564
- KRUGER, P.**  
Recovery of energy from fracture-stimulated  
geothermal reservoirs  
16 p0424 A77-44604  
Workshop on Geothermal Reservoir Engineering  
[PB-261319/8] 14 p0251 N77-21709
- KRUPPICK, A. C.**  
Aluminum or copper substrate panel for selective  
absorption of solar energy and the method of  
producing said panel  
[NASA-CASE-MFS-23518-1] 16 p0535 N77-31610  
Stainless steel panel for selective absorption of  
solar energy and the method of producing said  
panel  
[NASA-CASE-MFS-23518-2] 16 p0535 N77-31611
- KRUTILIN, V. A.**  
Calculation of the electric fields and currents in  
a plasma flowing in a spatially periodic  
magnetic field  
15 p0295 A77-35798
- KRUTZ, R.**  
Computer model of a solar-assisted heating design  
approach implemented on a minicomputer  
installation  
15 p0318 A77-38178
- KRUZHILIN, I. I.**  
Shaping of laser pulses in an amplifying system  
receiving input signals with a variable spectrum  
13 p0053 A77-15237
- KU, W. S.**  
Hydrogen by electrolysis to supplement pipeline  
gas supplies Technical and economic aspects  
[AIAA 77-1032] 16 p0405 A77-41569
- KUDIAROV, S. A.**  
Some problems involved in the development of a  
solar thermionic power plant  
16 p0436 A77-47421
- KUEHN, R.**  
Petrochemical basic products from coal -  
Production of basic and intermediate products  
for the chemical industry according to the  
Fischer-Tropsch process  
15 p0267 A77-32247
- KUEHN, R. E.**  
Optimal drawdown strategy for strategic petroleum  
reserves  
[PB-265838/3] 16 p0512 N77-28569
- KUESTER, J. L.**  
Conversion of waste organic material to gasoline  
[COO-2982-7] 15 p0377 N77-26325
- KUHAR, W. T.**  
Helicopter offshore operations  
16 p0421 A77-44437
- KUHARICH, R. F.**  
Operational report on an integrated solar-assisted  
optimized heat pump system  
14 p0171 A77-23658  
Operational analysis of a solar optimized heat pump  
16 p0478 A77-48986
- KUHMAN, H.**  
Non-nuclear energy technology. Low temperature  
cable for power transmission  
[BMFT-FB-T-76-01] 14 p0210 N77-17372
- KUHN, W.**  
Electrode-connecting material as a central  
component of high-temperature fuel cells. II -  
Investigation of selected high-conductivity  
mixed oxides  
13 p0056 A77-15817
- KUIPERS, J. W.**  
Factors in the planning of a national information  
system for renewable energy  
[PB-262003/7] 15 p0358 N77-24002
- KUKAINIS, O. A.**  
Analogy between thermal-convective and  
magnetohydrodynamic instabilities  
16 p0425 A77-44690

- KUKIN, I.  
Chemical reduction of SO<sub>3</sub>, particulates and NO<sub>x</sub> emissions  
15 p0294 A77-35188
- KUKLINSKII, M. I.  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method  
[BLL-M-25448-(5828.4P)] 13 p0112 N77-13235
- KULIEV, A. Z.  
Thermoelectric power of pseudoternary solid solutions  
13 p0014 A77-11917
- KULIK, C. J.  
Deashing of coal liquefaction products via partial deasphalting. I - Hydrogen-donor extraction effluents. II - Hydrogenation and hydroextraction effluents  
14 p0138 A77-20725
- KULIK, M. M.  
Quasi-analog models of large systems of algebraic equations  
16 p0433 A77-46959
- KULKARNI, S.  
Research and development of low cost processes for integrated solar arrays  
[COO-2721-76-1] 15 p0383 N77-26670
- KUMAGAI, T.  
The calcium-iodine cycle for the thermochemical decomposition of water  
15 p0275 A77-33340
- KUMAR, S.  
Performance of flat-plate collectors with planar reflectors  
[ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478  
The design of a sodium sulfate decahydrate heat exchanger for coolness storage  
16 p0450 A77-48760  
The Page-Jackson Elementary School solar heating and cooling system  
16 p0462 A77-48851
- KUNCIAL, K.  
The production and refining of crude oil into military fuels  
[AD-A024652] 13 p0095 N77-11207
- KUNIN, L.  
Analysis of the California energy industry  
[LBL-5928] 16 p0557 N77-33640
- KUNO, M. IA.  
Experimental study of several modes of operation of a laboratory section of a three-phase superconducting power transmission cable  
16 p0438 A77-47753
- KUNZE, J.  
On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs  
16 p0454 A77-48796
- KUNZE, J. P.  
Making electricity from moderate temperature fluids  
13 p0002 A77-10649  
Space heating systems new and conventional in the Northwest with emphasis on alternate energy adaptations  
13 p0028 A77-12736  
The economic generation of electricity from moderate temperature geothermal resources  
13 p0030 A77-12749  
Geothermal space heating - The symbiosis with fossil fuel  
16 p0455 A77-48797  
Plan for developing moderate temperature/low salinity geothermal resources  
[ANCR-1318] 14 p0223 N77-19614  
Geothermal R and D project  
[TREE-1008] 15 p0393 N77-27538
- KUO, S. C.  
A conceptual design study of closed Brayton cycle gas turbines for fusion power generation  
13 p0022 A77-12676  
System evaluation of aircraft-derivative gas turbines for naval ship propulsion applications  
16 p0445 A77-48718
- KURKOWSKI, K. J. W.  
Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts  
14 p0176 A77-24568
- KUROCHKIN, IO. V.  
A 2-MW electric arc generator with porous cooling of the interelectrode insert  
13 p0049 A77-13831
- KURSKAIA, A. A.  
Microwave radiometry of land and water areas on the earth surface from onboard aircraft laboratories  
16 p0433 A77-47201
- KURTZ, D. W.  
Aerodynamics as a subway design parameter  
13 p0070 A77-18721
- KURZKE, J.  
The pros and cons of variable geometry turbines  
15 p0340 N77-22140
- KURZWEIG, U. H.  
Two-phase Hartmann flows in the MHD generator configuration  
[AD-A036452] 16 p0518 N77-28948
- KUSAKA, Y.  
Experiment on MHD generator with a large-scale superconducting magnet /ETL Mark V/  
13 p0049 A77-13728  
Experiment on MHD generator with a large scale superconducting magnet /ETL Mark V/  
15 p0325 A77-39527
- KUSIAKOVICH, J.  
A competitively-priced solar home, using concentrating collectors  
16 p0477 A77-48978
- KUSKO, A.  
Modeling of electric drive systems for KEW /flywheel/ vehicles  
14 p0200 A77-29469
- KUSSMAN, A.  
Possibilities for utilizing wind energy  
13 p0056 A77-15853
- KUSSMAUL, S.  
LANDSAT (ERTIS) used as a basis for geological volcanological mapping in the central Andes  
[NASA-TN-75024] 15 p0390 N77-27474
- KUSTON, R. L.  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496
- KUSTOV, M. H.  
High-power systems with ac generators and inertial storage banks for electrophysical devices  
15 p0261 A77-31426
- KUSUDA, T.  
Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire  
[PB-254179/5] 13 p0091 N77-10687
- KUSWA, G. W.  
Overview of energy research and development administration inertial confinement fusion program  
14 p0146 A77-21744
- KUTATELADZE, S. S.  
Problems of heat and mass transfer in geothermal energetics  
14 p0174 A77-24202
- KUTERV, B. V.  
Investigation of the Hall effect in the plasma of an inductive high-frequency discharge  
15 p0297 A77-36088
- KUZMICHYEV, V. S.  
Influence of the intended use of an aircraft on the optimal parameters of gas-turbine power plants  
15 p0266 A77-32086
- KUZNETSOV, R. I.  
Review on the IAEA workshop on large fusion Tokamak projects  
14 p0146 A77-21737
- KUZNETSOV, I. H.  
Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies  
13 p0018 A77-12361
- KUZNETSOVA, T. H.  
Investigation of two-dimensional electric effects in a sectional MHD-channel  
15 p0317 A77-37930
- KYDD, P. H.  
The H-Coal Process  
14 p0192 A77-27289
- KYDES, A. S.  
Regional land use and energy modeling.  
[BNL-21809] 15 p0378 N77-26595



## L

- LA ROCHE, U.  
Modern technology electrolysis for power application  
15 p0278 A77-33364  
The Greenland hydropower as a source of  
electrolytic hydrogen  
15 p0285 A77-33416
- LABAT, P.  
Morphological analysis as a design aid: An  
application to solar energy conversion processes  
16 p0429 A77-46467
- LACEY, P. D.  
600 kW Organic Rankine Cycle Waste Heat Power  
Conversion System  
16 p0459 A77-48829
- LACONTI, A. B.  
Development of fuel cell CO detection instruments  
for use in a mine atmosphere  
[PB-254823/8]  
13 p0095 N77-11380
- LADELFA, C. J.  
Direct production of methane and benzene from coal  
15 p0306 A77-36766
- LAGRAFF, J. E.  
Thermal simulation of a building with solar  
assisted closed liquid loop unitary heat pumps  
[ASME PAPER 76-WA/SOL-23]  
14 p0190 A77-26528  
Commercial building unitary heat pump system with  
solar heating  
[PB-255488/9]  
13 p0099 N77-11551
- LAGUES, H.  
A hydride compressor  
13 p0046 A77-13336
- LAHAYE, P.  
Solubilization of coal in organic media  
[NASA-TN-75151]  
15 p0390 N77-27498
- LAHMANN, E.  
Particle size distributions of dusts in the flue  
gas of power plants and in atmospheric air  
15 p0265 A77-31889
- LAI, S.-C.  
Improved negative electrodes for lithium/iron  
sulfide batteries  
16 p0448 A77-48742
- LAIGBOZ, J.  
Characteristic aspects of the evolution of the  
French electric balance in 1975  
13 p0012 A77-11340
- LAINE, E. P.  
Monitoring fluid flow by using high-frequency  
electromagnetic probing  
[UCRL-51579]  
13 p0120 N77-14393
- LAKI, G.  
Experience in putting the Kiskadee hydroelectric  
power plant on line  
13 p0010 A77-11301
- LALEVIC, B.  
Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509
- LANB, G. B.  
Underground coal gasification  
16 p0428 A77-45954
- LANETHE-PARREIX, D.  
Possible applications of geothermal energy in France  
14 p0175 A77-24208
- LANFAL, L.  
Heat transportation by hot water pipe-lines at 90  
deg C  
[AD-A038301]  
16 p0512 N77-28453
- LANCASTER, E. W.  
Advanced coal gasification system for electric  
power generation  
[PB-1514-176]  
13 p0088 N77-10653
- LANCASTER, F. W.  
Factors in the planning of a national information  
system for renewable energy  
[PB-262003/7]  
15 p0358 N77-24002
- LAND, C. S.  
Field experiment of in-situ oil recovery from a  
Utah tar sand by reverse combustion  
14 p0193 A77-27348
- LANDECKER, K.  
On power-generating thermojunctions with radial  
flow of current  
16 p0500 A77-50202
- LANDEL, R. P.  
A simple approach to metal hydride alloy  
optimization  
15 p0281 A77-33388  
A simple approach to metal hydride alloy  
optimization  
14 p0243 N77-21624
- LANDES, R.  
Definition study for photovoltaic residential  
prototype system  
[NASA-CR-135039]  
13 p0113 N77-13532
- LANDGREENE, A. B.  
ERDA's hydrogen programs  
15 p0284 A77-33412  
ERDA's hydrogen programs  
14 p0246 N77-21650
- LANDSBERG, R. B.  
Weather, climate and human settlements  
[WNO-448]  
15 p0387 N77-27038
- LANDSBERG, R. B.  
Workshop to Review FEA's 1976 National energy  
outlook  
[PB-268149/2]  
16 p0547 N77-32601
- LANDSBERG, P. T.  
Thermodynamic constraints, effective temperatures  
and solar cells  
14 p0147 A77-21779  
Theory of the Schottky barrier solar cell  
15 p0266 A77-32116  
A simple model for solar energy economics in the U.K.  
15 p0298 A77-36245  
Meteorological effects on solar cells  
15 p0338 A77-40149
- LANDSMAN, A. P.  
Use of radiation reflected from earth to increase  
the power of solar panels  
15 p0363 N77-24586
- LANE, G. A.  
Solar energy subsystems employing isothermal heat  
sink materials  
[PB-258738/4]  
14 p0233 N77-20616
- LANE, R. A.  
Definition study for photovoltaic residential  
prototype system  
[NASA-CR-135056]  
13 p0113 N77-13533
- LANE, S. D.  
Test and evaluation of the Navy half-watt RTG  
13 p0042 A77-12853
- LANEVILLE, A.  
Study of the feasibility of exploiting the  
galloping phenomenon as energy source  
16 p0407 A77-41722
- LANGE, E. A.  
Ignition of flammable gases in crude-oil tankers  
as a result of metal fracture  
[AD-A027411]  
13 p0127 N77-15121
- LANGER, H.  
Development of a turbine rotor of silicon nitride  
16 p0503 A77-50651
- LANGLOIS, R. W.  
Future natural gas supply to the Northeast  
[BNL-50558]  
15 p0364 N77-24595
- LANGPAPPE, R.  
Development of sodium/sulfur-cells  
13 p0026 A77-12716
- LANIER, W. S.  
Environmental aspects of low Btu gas combustion  
16 p0440 A77-48178
- LANKARD, D. B.  
Evaluation of the calcium aluminate bond phase in  
refractory castables as related to their use in  
synthane gasifier  
[PB-266854/9]  
16 p0525 N77-30255
- LANGSING, F. L.  
High-efficiency solar concentrator  
13 p0083 N77-10104  
A two-dimensional finite difference solution for  
the transient thermal behavior of tubular solar  
collector  
13 p0083 N77-10105  
Computer modeling of a regenerative solar-assisted  
Rankine power cycle  
14 p0218 N77-19112  
Status of Goldstone solar energy system study of  
the first Goldstone energy project  
14 p0235 N77-21126

- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 N77-31207
- LANTZLE, U.  
World energy supply and demand and the future of nuclear power [IAEA-CN-36/583] 16 p0560 N77-33680
- LANZA, C.  
Efficiency calculations for thin-film polycrystalline semiconductor Schottky barrier solar cells 15 p0258 A77-30723
- LAPIDES, M. E.  
Nuclear unit productivity analysis [PB-257553/8] 13 p0132 N77-15528
- LAPIN, E. E.  
Economic competitiveness of windmills 16 p0417 A77-42898
- LAPINSKI, W. P.  
Development of nondestructive evaluation methods for coal-conversion systems [CONF-760472-2] 14 p0216 N77-18567
- LAPP, H. M.  
Methane production through bioconversion of agriculture residues 16 p0489 A77-49081
- LAPSHIN, A. M.  
The M-14P aircraft engine 15 p0320 A77-38300
- LAQUER, H. L.  
Superconductivity, energy storage and switching 15 p0299 A77-36309  
Design of multifilamentary Nb<sub>3</sub>Sn superconductor tailored to the requirements of a dc superconducting power transmission line [LA-UR-77-99] 15 p0389 N77-27311
- LAROCHE, U.  
Modern technology electrolysis for power application 14 p0239 N77-21598  
The Greenland hydropower as a source of electrolytic hydrogen 14 p0246 N77-21655
- LARRABEE, E.  
Wind energy conversion [PB-256198/3] 13 p0115 N77-13552
- LARRABEE, E. E.  
Wind energy conversion [PB-268718/4] 16 p0559 N77-33667
- LARSEN, R.  
Development of a mobile solar testing and recording /STAR/ system 13 p0072 A77-19047
- LARSON, D. C.  
Double-exposure collectors with mirrors for solar-heating systems [ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476
- LARSON, M. B.  
The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- LARUE, J. C.  
Assessment of high-efficiency solar cells performance 14 p0148 A77-21785
- LASER, D. L.  
Monitoring fluid flow by using high-frequency electromagnetic probing [UCRL-51579] 13 p0120 N77-14393
- LASH, T. B.  
Choosing an electrical energy future for the Pacific northwest: An alternative scenario [PB-264048/0] 15 p0375 N77-25674
- LASKA, R.  
Interagency energy/environment research and development program: Status report 3 [PB-267443/0] 16 p0558 N77-33662
- LASKIN, J. B.  
Recent developments of large electrolytic hydrogen generators 15 p0277 A77-33358  
Recent developments of large electrolytic hydrogen generators 14 p0238 N77-21592
- LASKUS, L.  
Particle size distributions of dusts in the flue gas of power plants and in atmospheric air 15 p0265 A77-31889
- LASZLO, J.  
Application of the Stretford process for H<sub>2</sub>S abatement at the Geysers geothermal power plant 13 p0025 A77-12743
- LATHROP, J.  
Energy R&D modeling for budgetary decisions 15 p0319 A77-38218
- LATHWELL, D. J.  
Bioconversion of agricultural wastes for pollution control and energy conservation [TID-27164] 15 p0383 N77-26675
- LATIMER, E. J.  
Variable flow turbines 15 p0340 N77-22142
- LATZKO, D. G. H.  
Energy prospects in the Netherlands 15 p0307 A77-36801
- LAU, K. C.  
Continuously-variable transmission concepts suitable for flywheel hybrid automobiles 16 p0444 A77-48705
- LAU, K. H.  
Numerical solutions for steady free convection in island geothermal reservoirs 14 p0174 A77-24205
- LAUDIG, D. J.  
Design factors for a cost effective solar collection system 16 p0496 A77-49143
- LAUGHLIN, D. E.  
Thermal, fluid flow and mechanical performance characteristics of a subatmospheric pressure, distributed flow flat plate collector 16 p0473 A77-48945
- LAUKHUP, W. L.  
Production of ammonia using coal as a source of hydrogen [PB-259388/7] 14 p0233 N77-20613
- LAUL, J. C.  
Characterization of substances in products effluents and wastes from synthetic fuel production tests [BNWL-2131] 16 p0540 N77-31675
- LAUMANN, B.  
Solar energy installation for the project 'Motto di Leno' in Minusio/Tessin 16 p0441 A77-48257
- LAUMANN, E. A.  
The NASA Hydrogen Energy Systems Technology study - A summary 15 p0284 A77-33413  
The NASA hydrogen energy systems technology study: A summary 14 p0246 N77-21651
- LAURENCE, S.  
Marine pastures: A by-product of large (100 megawatt or larger) floating ocean-thermal power plants [COO-2581-3] 16 p0555 N77-33625
- LAUTENSCHLAGER, F. W.  
Firing systems for combustion of natural gas, crude oil and bunker C-oil - Selection of parameters for thermal power station units and the applied systems of steam generation 16 p0439 A77-48092
- LAVAN, Z.  
Putting alternative sources of energy into prospective 16 p0414 A77-42633
- LAVI, A.  
Ocean Thermal Energy Conversion (OTEC) 16 p0526 N77-30278
- LAVIGNA, T. A.  
The ATS-6 power system - Hardware implementation and orbital performance 13 p0040 A77-12831  
The ATS-6 power system: Hardware implementation and orbital performance [NASA-TP-1023] 16 p0543 N77-32229
- LAVIT, P.  
The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854
- LAVRENTIEV, O. A.  
Ignition of a pulsed thermonuclear reaction by high-current ion beams 14 p0164 A77-23106

- LAW, S. H.**  
Gas turbine HTGR - A total energy utilization option  
[AIAA 77-1016] 16 p0403 A77-41560
- LAWAND, T. A.**  
Environmentally designed housing incorporating  
solar energy 13 p0079 A77-19115  
Rural energy centre for Africa using solar, wind  
and biogas energies 16 p0496 A77-49139
- LAWSON, W. T.**  
Systems study of fuels from sugar cane, sweet  
sorghum, and sugar beets  
[TID-27032] 14 p0211 N77-17570  
Systems study of fuels from sugarcane, sweet  
sorghum, sugar beets, and corn  
[TID-27336] 15 p0377 N77-26324
- LAWIT, R. L.**  
Development of a baseline reference design for an  
open cycle MHD power plant for commercial service  
14 p0140 A77-21232  
Status of the reference dual-cycle MHD-steam power  
plant 15 p0332 A77-39577  
Open-cycle coal burning MHD power plants for  
commercial service 15 p0333 A77-39578
- LAWRENCE, J.**  
Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility 13 p0043 A77-12867  
Large windpower systems integrated with existing  
electric utilities 16 p0490 A77-49094  
Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility  
[CONF-760906-8] 14 p0222 N77-19609
- LAWRENCE, L. B., JR.**  
ERDA fuel cell programs 16 p0447 A77-48734
- LAWRENCE, R. V.**  
An improved electrolyte for direct oxidation fuel  
cells  
[AD-A026164] 13 p0131 N77-15518
- LAWRENCE, V. P.**  
Advanced fuel nuclear reaction feasibility using  
laser compression. II 16 p0435 A77-47359
- LAWSON, B. D.**  
Mount for continuously orienting a collector dish  
in a system adapted to perform both diurnal and  
seasonal solar tracking  
[NASA-CASE-MFS-23267-1] 14 p0228 N77-20401
- LAWSON, C. A.**  
Sensitivity analysis for OTEC propane and mixture  
cycles 16 p0485 A77-49047  
Economic evaluation of mixture and pure fluid  
cycles in ocean thermal energy conversion systems  
[ORO-4918-8] 14 p0217 N77-18578
- LAWSON, C. C.**  
Vapor-liquid equilibrium of hydrogen/tetralin  
system at elevated temperatures and pressures  
16 p0412 A77-42406
- LAWSON, D. D.**  
A simple approach to metal hydride alloy  
optimization 15 p0281 A77-33388  
A simple approach to metal hydride alloy  
optimization 14 p0243 N77-21624
- LAWSON, K. S.**  
The pay-off for advanced technology in commercial  
aircraft design and operation 13 p0071 A77-19012
- LAWTON, R. G.**  
Preliminary assessment of a geothermal energy  
reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- LAYER, G.**  
Efficient energy utilization 15 p0264 A77-31578
- LE GALL, J. C.**  
Some applications of photovoltaic solar energy  
14 p0155 A77-21855
- LE MEHAUTE, A.**  
A parametric analysis of the structure of  
international energy consumption 15 p0298 A77-36242
- LE PERA, H. B.**  
Investigation of the causes of stuck servovalves  
in U.S. Army hydraulic systems using MIL-H-46170  
'Hydraulic Fluid, Rust Inhibited, Fire  
Resistant, Synthetic Hydrocarbon Base'  
[ASLE PREPRINT 77-AN-2A-1] 15 p0296 A77-35956
- LE PETIT, J.**  
The ecology of a marine littoral receiving  
effluents from a petroleum refinery 16 p0433 A77-47173
- LE PHAT VINH, A.**  
The French CNRS 1000 kW solar furnace -  
Description, performance characteristics,  
present utilization, and perspectives 15 p0262 A77-31473
- LE VERT, P.**  
Energy consumption in various modes of  
transportation 13 p0050 A77-14561
- LEAHY, M. P.**  
Future scenarios for urban transportation  
[PB-255349/3] 13 p0102 N77-11930
- LEBOUC, P.**  
Concorde - Endurance flights results 13 p0016 A77-12114
- LEBOURG, R.**  
Procedure for characterizing flat plate solar  
collectors 13 p0073 A77-19056
- LEBOWITZ, H. B.**  
Deashing of coal liquefaction products via partial  
deasphalting. I - Hydrogen-donor extraction  
effluents. II - Hydrogenation and  
hydroextraction effluents 14 p0138 A77-20725
- LECOANET, A.**  
Thermodynamics of thermochemical water  
decomposition processes 14 p0238 N77-21574
- LECUYER, R. P.**  
An economic assessment of fuelgas from water  
hyacinths 15 p0314 A77-37663
- LEDENT, P.**  
Underground gasification of coal 14 p0198 A77-28759  
Underground gasification 15 p0308 A77-36813
- LEE, C. W.**  
Radiative characteristics of metallic particle  
coatings and their applications in selective  
solar energy collectors 16 p0545 N77-32587
- LEE, D. O.**  
Focused solar collector analysis with axially  
varying input due to shadowing from adjacent  
collectors 13 p0069 A77-18450  
Synergistic effects of shadowing on a solar  
collector matrix  
[SAND-76-0012] 13 p0122 N77-14587  
Focused solar collector analysis with axially  
varying input due to shadowing from adjacent  
collectors  
[SAND-76-5061] 15 p0345 N77-22635
- LEE, G. K.**  
Coal-in-oil - A substitute boiler fuel  
[ASME PAPER 76-WA/PO-2] 14 p0185 A77-26453
- LEE, J.**  
Assessment of fuel-conservation potential of a  
ground-transportation system due to full  
utilization of its mass transportation  
capabilities  
[PB-262125/8] 15 p0347 N77-22657
- LEE, K. H.**  
Electric power development in the Pacific  
Northwest Region: Institutional commitments and  
alternatives, phase 1 15 p0348 N77-22671  
[PB-262382/5]
- LEE, Q.**  
Flash hydrolysis process for conversion of  
lignite to liquid and gaseous products 15 p0301 A77-36334

- LEE, T. C.  
On shallow-hole temperature measurements. A test study in the Salton Sea geothermal field [PB-262643/0] 15 p0343 N77-22602
- LEESSE, T. M.  
The conversion of ocean farm kelp to methane and other products 15 p0314 A77-37662
- LEFROIS, R. T.  
Thermal energy storage for solar power plants 13 p0027 A77-12731  
Inorganic phase change materials for energy storage in solar thermal program 16 p0492 A77-49103
- LEHMAN, M.  
Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449
- LEHMAN, S. J.  
Steam station repowering - A near-term method of energy conservation 13 p0022 A77-12679
- LEHMENT, B.  
Thermonuclear fusion power 15 p0296 A77-35920  
Power loss problems in FTFAP coil systems [TRITA-PRU-77-02] 16 p0549 N77-32910
- LEHOVEC, K.  
Degradation of solar cell efficiency by sheet resistance 16 p0438 A77-47854
- LEHRFELD, D.  
Practicability study of Stirling total energy systems 16 p0465 A77-48882
- LEHTINEN, A. M.  
Controllability analysis for passively and actively controlled heat pipes [AIAA PAPER 77-776] 15 p0312 A77-37281
- LEIGH, J. G.  
Analysis of energy projections for infrastructure development requirements [PB-266419/1] 16 p0524 N77-29640
- LEININGER, G.  
Statistics of the radiated field of a space-to-earth microwave power transfer system [NASA-TN-X-73684] 16 p0526 N77-30314
- LEISHER, W. B.  
PULSAR, an unconventional topping stage 13 p0034 A77-12788  
Pulsed energy conversion with a dc superconducting magnet 13 p0081 A77-19293  
PULSAR - A flux compression stage for coal-fired power plants 14 p0190 A77-26544
- LENNON, A. W.  
Reductant gases for flue gas desulfurization systems [PB-254168/8] 13 p0092 N77-10722  
Systems study of fuels from sugar cane, sweet sorghum, and sugar beets [TID-27032] 14 p0211 N77-17570
- LENGQUIST, R.  
Geothermal power - The 'sleepers' in the energy race 13 p0056 A77-15845
- LENZE, B.  
The influence of the Reynolds number on the profiles of velocity and concentration in free jets of different density 13 p0069 A77-18500
- LEO, P. P.  
Control of waste and water pollution from power plant flue gas cleaning systems [PB-259211/1] 14 p0227 N77-19953
- LEONARD, R. P.  
The commercial production of hydrogen by the K-T process 13 p0032 A77-12769
- LEONARD, J. T.  
Electrostatic properties of JP-5 jet fuel from alternate sources [AD-A025684] 13 p0103 N77-12232
- LEONOV, P. G.  
RF oscillations of a plasma in crossed E x H fields 16 p0503 A77-50350
- LEONTIEV, V.  
Electromechanical stabilization system 16 p0511 N77-28211
- LEPERT, C.  
The use of solar cells as energy supply for a pumping system 14 p0155 A77-21854
- LEPORE, J. A.  
Residential solar heating retrofit in the urban environment 16 p0478 A77-48992
- LEPOUTRE, G.  
Hydrogen production by photoelectrochemistry in visible light 14 p0150 A77-21813
- LERFALD, G. M.  
Solar radiation atmospheric transmission research, phase 1 [PB-266010/8] 16 p0518 N77-28689
- LESHCHINOV, A.  
The technical concept of the IL-62M. II - Fuel system 14 p0156 A77-22120
- LESHUK, J. P.  
Solar pond stability experiments 16 p0482 A77-49028
- LESKIEWICZ, J.  
Fundamentals of coal liquefaction 15 p0309 A77-36814
- LESKOVJAN, L. L.  
Nuclear power - Compared to what 13 p0017 A77-12234
- LESSARD, R. D.  
Steam station repowering - A near-term method of energy conservation 13 p0022 A77-12679  
Conceptual design of underground compressed air storage electric power systems 16 p0451 A77-48770
- LESSE, P. F.  
Optimal control of flow in low temperature solar heat collectors 13 p0019 A77-12409
- LETIN, U. A.  
Use of radiation reflected from earth to increase the power of solar panels 15 p0363 N77-24586
- LEU, C.  
Environmental protection measuring technique. Sensor for automatic continuous emission control of gases [BHFT-PB-T-76-03] 14 p0209 N77-16467
- LEVAGUERSE, P.  
Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames [PB-259911/6] 14 p0234 N77-20639
- LEVELL, R. R.  
Preliminary report on the CTS transient event counter performance through the 1976 spring eclipse season [NASA-TN-X-73487] 13 p0083 N77-10116
- LEVENTAL, G. B.  
Problems of analysis of the power characteristic of a high capacity magnetohydrodynamic power station 14 p0143 A77-21270
- LEVERENZ, D. J.  
Predicting the performance of solar energy systems [AD-A035608] 15 p0373 N77-25660
- LEVERLE, R. M.  
Optimization of PT-doped Kocite (R) trademark electrodes in H3 PO4 fuel cells [AD-A034604] 15 p0365 N77-24618
- LEVI, J.  
The Osmotic power plant 13 p0021 A77-12668
- LEVIN, E. R.  
Epitaxial silicon technology for low-cost solar cells [PB-262396/5] 15 p0374 N77-25663
- LEVINE, S. K.  
A method for increasing the efficiency of the electric generating process 14 p0183 A77-26087
- LEVINS, P. L.  
Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation [PB-268232/6] 16 p0542 N77-32051

- LEVITZ, N.  
Development of compound parabolic concentrators for solar-thermal electric and process heat applications  
13 p0038 A77-12812
- Development of compound parabolic concentrators for solar thermal applications  
[ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516
- Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications  
16 p0483 A77-49031
- LEVITZ, N. H.  
Design problems associated with the use of evacuated glass receivers for solar collectors  
[CONF-76C6128-1] 15 p0393 N77-27536
- LEVY, E. K.  
Analysis of power cycles with centrifugal fluidized bed coal combustion  
16 p0453 A77-48787
- LEVY, H. J.  
Energy and environmental considerations in extending heat pump applications  
13 p0062 A77-17058
- LEVY, R.  
Wind power prediction models  
[NASA-CR-149235] 13 p0105 N77-12509
- LEWIS, C. W.  
Fuels from biomass - Energy outlay versus energy returns: A critical appraisal  
15 p0322 A77-38673
- LEWIS, D. K.  
Hydrogen peroxide emission levels from a hydrogen fueled combustion engine  
16 p0399 A77-40644
- LEWIS, R.  
The SYNTHANE process - Current status  
14 p0192 A77-27286
- LEWIS, R. I.  
A theory and experimental investigation of ducted wind turbines  
16 p0410 A77-42072
- LEY, W.  
The determination of the performance characteristics of solar collectors  
14 p0203 A77-29573
- LEYERLE, R. W.  
Optimization of Pt-doped Kocite (trademark) electrodes in H<sub>3</sub> PO<sub>4</sub> fuel cells  
[AD-A025326] 13 p0107 N77-12529
- Optimization of platinum-doped Kocite electrodes in H<sub>3</sub>PO<sub>4</sub> fuel cells  
[AD-A039242] 16 p0529 N77-30626
- LIAO, C. K.  
Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings  
[PB-254665/3] 13 p0091 N77-10689
- LIBOWITZ, G. G.  
An evaluation of the use of metal hydrides for solar thermal energy storage  
13 p0028 A77-12739
- LICHTENBERG, A. J.  
A comparison of residential and commercial energy use in the United States and Sweden  
15 p0297 A77-36114
- LICHTIN, N. H.  
A multilayer iron-thionine photogalvanic cell  
13 p0007 A77-11108
- The dependence of current output of the Ti-TL SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on photostationary state composition  
16 p0502 A77-50220
- Photochemical conversion of solar energy  
[PB-255703/1] 13 p0090 N77-10685
- Photochemical conversion of solar energy  
[PB-262450/0] 15 p0366 N77-24628
- LIDORENKO, N. S.  
Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters  
16 p0402 A77-41360
- LIEB, D.  
Advanced thermionic converter development  
13 p0043 A77-12862
- Thermionic converter studies at Thermo Electron  
16 p0466 A77-48887
- Thermionic converter performance with oxide collectors  
16 p0466 A77-48888
- LIEB, D. P.  
High efficiency thermionic converter studies  
[NASA-CR-135263] 16 p0546 N77-32592
- LIEBERMAN, A. R.  
The low cost high performance generator /LCHPG/  
13 p0042 A77-12855
- LIEBERMANN, R. W.  
Design of closed-cycle MHD generator with nonequilibrium ionization and system  
15 p0303 A77-36381
- LIEBERT, C. H.  
Effect of ceramic coating of JT8D combustor liner on maximum liner temperatures and other combustor performance parameters  
[NASA-TN-X-73581] 13 p0126 N77-15037
- LIERS, H. S.  
Performance of flat-plate collectors with planar reflectors  
[ASME PAPER 76-WA/HT-27] 14 p0186 A77-26478
- The Page-Jackson Elementary School solar heating and cooling system  
16 p0462 A77-48851
- LIGON, C.  
Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
13 p0043 A77-12867
- Large windpower systems integrated with existing electric utilities  
16 p0490 A77-49094
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
[CONF-760906-8] 14 p0222 N77-19609
- LIKALTER, A. A.  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- LILES, A. W.  
Selection of driving cycles for electric vehicles of the 1990's  
13 p0024 A77-12702
- LILLREHT, L. U.  
Analysis of thermal performance of 'Solaris' water-trickle solar collector  
[ASME PAPER 76-WA/SOL-21] 14 p0190 A77-26526
- Performance and analysis of 'Solaris' water-trickle solar collector  
16 p0472 A77-48939
- Performance and analysis of SOLARIS water-trickle solar collector  
[CONF-760821-9] 14 p0232 N77-20599
- Analysis of thermal performance of Solaris water-trickle solar collector  
[CONF-761107-17] 15 p0382 N77-26668
- Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 N77-26669
- LILLINGTON, D. B.  
Cast polycrystalline silicon Schottky-barrier solar cells  
16 p0503 A77-50295
- LIMA VERDE LEAL, M. H.  
Solar powered steam generation  
16 p0459 A77-48832
- LIMAYE, D. H.  
Comparative state-of-the-art assessment of gas supply modeling  
[EPRI-BA-201] 16 p0539 N77-31656
- LIN, H. H.  
Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures  
16 p0412 A77-42406
- LIN, J. H.  
Improved black nickel coatings for flat plate solar collectors  
14 p0204 A77-29585
- LIN, S.  
A heat transfer criterion on the geometric configuration of flat solar water heaters  
16 p0472 A77-48944
- LIN, S. S.  
Recent tests of industrial gas turbine combustors fueled with simulated low heating value coal gas  
[ASME PAPER 76-WA/GT-3] 14 p0185 A77-26459

- LIN, W.**  
Modeling residential energy use 13 p0027 A77-12726  
Engineering-economic model of residential energy use [ORNL-TM-5470] 14 p0231 A77-20580  
Improved engineering-economic model of residential energy use [ORNL-CCN-8] 16 p0557 A77-33644
- LINARES SOLANO, A.**  
Concurrent carbon gasification and carbon deposition in chars 16 p0568 A77-51590
- LINCOLN, R. L.**  
Spectral reflectance of TiN/x/ and ZrN/x/ films as selective solar absorbers 16 p0423 A77-44492
- LINDAL, B.**  
Preliminary research on Ocean Energy Industrial Complexes 16 p0484 A77-49042  
Preliminary research on ocean energy industrial complexes, phase 1 [ORO-4915-3] 14 p0248 A77-21669
- LINDEN, L. E.**  
Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases [PB-263523/3] 15 p0354 A77-23518
- LINDENA, S.**  
Comparison of candidate solar array maximum power utilization approaches 13 p0041 A77-12836
- LINDGREEN, E. R.**  
Two-phase Hartmann flows in the MHD generator configuration [AD-A036452] 16 p0518 A77-28948
- LINDHOLM, P. A.**  
Fundamental electronic mechanisms limiting the performance of solar cells 15 p0257 A77-30710  
Basic mechanisms governing solar-cell efficiency 16 p0486 A77-49060  
Studies of silicon p-n junction solar cells [NASA-CR-149669] 14 p0215 A77-18557
- LINDHAYEE, J.**  
Advanced vertical-junction silicon solar cells [AIAA PAPER 77-486] 14 p0172 A77-23906  
Development of 20 percent efficient solar cell [PB-2559C3/7] 13 p0108 A77-12548  
Solar breeder: Energy payback time for silicon photovoltaic systems [NASA-CR-153060] 15 p0362 A77-24581  
Development of a high efficiency thin silicon solar cell [NASA-CR-153905] 15 p0391 A77-27502  
Energy requirement for the production of silicon solar arrays [NASA-CR-153409] 16 p0528 A77-30604
- LINDNER, P.**  
Physical, chemical, and technological principles of latent heat storage 14 p0203 A77-29571
- LINDERBERGER, W. C.**  
Applied research in the general area of charged particle chemistry related to coal-fired MHD [PB-263873/2] 15 p0387 A77-26987
- LING, R. T.**  
Calculation of end effects in open-cycle MHD power generators 15 p0329 A77-39558
- LINGARD, M. P. A.**  
Electricity and heat production - Energy efficiency versus cost efficiency 13 p0011 A77-11338
- LINGELBACH, D. D.**  
Simulation of wind turbine generator system power flow dynamics 14 p0158 A77-22650
- LINV, R. J.**  
Future aircraft requirements: A notebook of airline thoughts 13 p0117 A77-13976
- LINSOFT, B. S.**  
Experimental data and theoretical analysis of an operating 100 kW wind turbine 16 p0467 A77-48898  
Early operation experience on the ERDA/NASA 100 kW wind turbine [NASA-TM-X-71601] 13 p0086 A77-10640
- LIOR, E.**  
Thermal energy storage considerations for solar-thermal power generation 13 p0027 A77-12732  
Solar energy and the steam Rankine cycle for driving and assisting heat pumps in heating and cooling modes 14 p0177 A77-24571  
Residential solar heating retrofit in the urban environment 16 p0478 A77-48992  
Solar energy application considerations for housing in depressed communities 16 p0494 A77-49126
- LIPINSKY, E. S.**  
The prospects for fuels from biomass 16 p0445 A77-48713  
Field crops as a future source of fuels and chemical feedstocks 16 p0489 A77-49080  
Systems study of fuels from sugar cane, sweet sorghum, and sugar beets [TID-27032] 14 p0211 A77-17570  
Systems study of fuels from sugarcane, sweet sorghum, sugar beets, and corn [TID-27336] 15 p0377 A77-26324
- LIPO, T. A.**  
Research into the impact on electrical equipment from variable-speed operation of pumped-storage plants [PB-268323/3] 16 p0548 A77-32618
- LIPPERT, T. E.**  
Liquid-metal magnetohydrodynamic system evaluation 13 p0034 A77-12784  
ECAS MHD system studies 14 p0142 A77-21268
- LIPPS, Y. W.**  
A new method for collector field optimization 13 p0074 A77-19070  
Four different views of the heliostat flux density integral 14 p0158 A77-22645  
A solar flux density calculation for a solar tower concentrator using a two-dimensional Hermite function expansion 16 p0405 A77-41578
- LIPPY, L. J.**  
ERDA's central receiver solar thermal power system studies 16 p0526 A77-30279
- LIPSCHUTZ, B. C.**  
A method for estimating hourly averages of diffuse and direct solar radiation under a layer of scattered clouds 13 p0019 A77-12412
- LISSANAW, P. B. S.**  
Aerodynamics of the Darrieus rotor 13 p0050 A77-14559
- LITCHFIELD, J. E.**  
Systems study of fuels from sugar cane, sweet sorghum, and sugar beets [TID-27032] 14 p0211 A77-17570
- LITTLE, J.**  
The use of functionalized polymers as photosensitizers in an energy storage reaction 16 p0501 A77-50208
- LITTLE, P.**  
Emission and deposition of petrol engine exhaust Pb. I - Deposition of exhaust Pb to plant and soil surfaces 15 p0333 A77-39655
- LITTLER, D. J.**  
The oceans as a source of electricity 16 p0412 A77-42401
- LITTLER, E. G.**  
Technology requirements for advanced earth-orbital transportation systems: Summary report [NASA-CR-2867] 16 p0550 A77-33255
- LITTLEWOOD, K.**  
Gasification - Theory and application 16 p0402 A77-41448
- LIU, B. Y. B.**  
The ASHRAE monograph on applications of solar energy for heating and cooling buildings 14 p0167 A77-23441
- LIU, B. K.**  
Theoretical, numerical, and physical techniques for characterizing power plant plumes [PB-253099/6] 13 p0101 A77-11599

- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model  
[PB-264622/8] 16 p0517 N77-28628
- LIU, S. G.  
High level concentration of sunlight on silicon solar cells 15 p0267 A77-32208
- LIU, S. S.  
Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750
- LIU, S. T.  
Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire  
[PB-254179/5] 13 p0091 N77-10687  
Comparison of computer-predicted and observed energy uses in a multi-family high-rise apartment building  
[PB-267829/0] 16 p0539 N77-31665
- LIU, Y.  
Hydrogen separation and compression through hydride formation and dissociation by low-level heat 13 p0032 A77-12770
- LIUBASHEVSKAYA, T. L.  
Investigation of p-Al/x/Ga/1-x/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra 14 p0143 A77-21311
- LIUBCHIK, G. B.  
Burnout of gaseous fuel in a tube combustion chamber with longitudinally distributed air supply 15 p0272 A77-33170
- LIUBIMOV, G. A.  
A consideration of some three-dimensional effects in MHD channel 15 p0330 A77-39560
- LIVENMAN, J. L.  
Public acceptance of nuclear power  
[IAEA-CN-36/507] 16 p0555 N77-33630
- LJUNGSTROM, O.  
Large scale Wind Energy Conversion System /WECS/ design and installation as affected by site wind energy characteristics, grouping arrangement and social acceptance 14 p0165 A77-23360
- LOBO, P. C.  
Performance of an annular cylindrical solar collector 13 p0073 A77-19059
- LOCHOW, B.  
Conference report: Energy Conservation in Transportation and Construction  
[PB-255857/5] 13 p0100 N77-11562
- LOCKEN, J.  
User's guide to petroleum industry survey data type  
[PB-256635/4] 13 p0098 N77-11544
- LOCKER, D.  
Flywheel-electric hybrid vehicle 14 p0159 A77-22886
- LOCKLIN, D. W.  
Combustion additives for pollution control: A state-of-the-art review  
[PB-264068/8] 15 p0359 N77-24316
- LOCKMAN, W. J.  
Methane gas recovery from sanitary landfills in Southern California 14 p0182 A77-26077
- LOEB, S.  
The Osmotic power plant 13 p0021 A77-12668
- LOEBL, A. S.  
Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643
- LOEDING, J. W.  
The IGT low-Btu gas process - Design and economics 15 p0301 A77-36335
- LOEF, G. O. G.  
A method of comparing flat-plate air and liquid solar collectors for use in space heating applications 16 p0472 A77-48941  
Heating of buildings with solar energy 16 p0474 A77-48959  
Cooling subsystem design in CSU Solar House III 16 p0475 A77-48964
- Comparative performance of solar heating with air and liquid systems 16 p0475 A77-48967
- Design, construction, and testing of a residential solar heating and cooling system  
[COO-2577-10] 14 p0248 N77-21670
- Cooling subsystem design in CSU solar house 3  
[COO-2858-1] 16 p0514 N77-28592
- LOEFFLER, B. L.  
Materials utilization in a direct coal-fired MHD generator system 15 p0292 A77-35151
- LOEHKE, B. I.  
An investigation of electrohydrodynamic heat pipes  
[NASA-CR-151977] 15 p0342 N77-22422
- LOF, G. G.  
Preliminary performance of CSU Solar House I heating and cooling system 14 p0158 A77-22644  
Design of a solar heating and cooling system for CSU Solar House II 14 p0181 A77-25902
- Evaluation of the solar heating system in the Lof residence, Denver, Colorado  
[PB-258845/7] 14 p0233 N77-20617
- Comparative performance of solar heating with air liquid systems  
[COO-2868-1] 15 p0383 N77-26676
- LOFFESKI, J. J.  
A sulfurization process for the preparation of photovoltaic Cu/x/S and CuInS<sub>2</sub> thin films 13 p0076 A77-19087
- LOFLIN, C.  
National Airlines Fuel Management and Allocation Model 16 p0419 A77-43399
- LOFTHOUSE, J. H.  
A guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines 13 p0033 A77-12779  
Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396  
Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 N77-21634  
Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines  
[TREE-1036] 16 p0511 N77-28324
- LOGAN, R. A.  
GaAs double-heterostructure photodetectors 16 p0426 A77-45304
- LOITER, E. E.  
Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance 13 p0020 A77-12657
- LOKAI, B. V.  
Heat-pipe regenerator for gas turbine engine 13 p0020 A77-12528
- LOKMANHEKIM, B.  
Combined solar and petroleum energy HVAC system for a commercial building in Dhahran 13 p0078 A77-19111
- LOLLAR, B. B.  
A structural design process for solar energy systems 16 p0480 A77-49012
- LOMAX, G. B.  
Some UK progress in sodium sulphur technology  
[SAE PAPER 770280] 16 p0424 A77-44563
- LONDON, A. L.  
Recovery of energy from fracture-stimulated geothermal reservoirs 16 p0424 A77-44604
- LONGHOUSE, R. E.  
Noise mechanism separation and design considerations for low tip-speed, axial-flow fans 13 p0046 A77-13339
- LONGSWORTH, B. C.  
Assessment and study of existing concepts and methods of cryogenic refrigeration for superconducting transmission cables  
[COO-2552-6] 14 p0214 N77-18352
- LONGWELL, J. F.  
Synthetic fuels and combustion 16 p0439 A77-48159

- LOPUKHIN, V. M.**  
A microwave energy converter with a reversing magnetic field  
14 p0139 A77-21154
- LOBBER, H. W.**  
Methodology for the analysis of the impacts of electric power production in the West  
[LA-6720-PB] 16 p0533 N77-31428
- LOBGEON, M.**  
Autonomous station for the acquisition and concentration of heliometric data  
13 p0072 A77-19046
- LOBRIHAN, D.**  
Perceptual assessment of a new energy concept  
16 p0496 A77-49138
- LOESCH, H. G.**  
Thermal energy storage considerations for solar-thermal power generation  
13 p0027 A77-12732  
Thermal energy storage for heating and air conditioning  
13 p0057 A77-16206  
Design and costs of high temperature thermal storage devices using salts or alloys  
[ASME PAPER 76-WA/HT-34] 14 p0187 A77-26481  
Thermal energy storage with saturated aqueous solutions  
16 p0493 A77-49111  
Effect of solar home heating on electric utilities  
16 p0494 A77-49123
- LOBUSSO, J.**  
Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory  
[PB-262980/6] 15 p0356 N77-23619
- LOSCUTOFF, W. V.**  
Flywheel-heat engine power for an energy-economic personal vehicle  
[BNWL-2006] 14 p0214 N77-18448
- LOTH, J. L.**  
Vortex kinetic energy concentrator  
13 p0044 A77-12870
- LOTKE, M.**  
Evaluating a combined wind power/energy storage system  
15 p0287 A77-33596
- LOTZ, H. W.**  
Environmental protection measuring technique. Sensor for automatic continuous emission control of gases  
[BNFT-PB-T-76-03] 14 p0209 N77-16467
- LOUBSKY, W. J.**  
Molecular gas performance of a disk generator with swirl  
15 p0326 A77-39534
- LOUIS, E.**  
Research and development of low cost processes for integrated solar arrays  
[COO-2721-76-1] 15 p0383 N77-26670
- LOUIS, J. F.**  
Molecular gas performance of a disk generator with swirl  
15 p0326 A77-39534  
Design and performance of high temperature ceramic electrode modules  
15 p0327 A77-39543  
Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator  
15 p0329 A77-39554  
Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators  
15 p0329 A77-39555  
Environmental assessment of advanced energy conversion technologies  
16 p0452 A77-48778
- LOVE, C. G.**  
Analysis and forecast of electrical distribution system materials. Volume 3: Appendix  
[CONS/2050-1-VOL-3-APP] 16 p0551 N77-33430
- LOVE, L.**  
Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10090] 14 p0214 N77-18511
- LOVELL, R. A., JR.**  
The development of net energy estimates for extraction, handling, and processing of selected fuels  
15 p0291 A77-35147
- LOW, J. Y. F.**  
Catalytic hydrogenation of solvent-refined lignite to liquid fuels  
13 p0008 A77-11243
- LOWE, P. A.**  
Thermochemical energy storage systems  
13 p0028 A77-12738
- LOWE, R. M.**  
The Asphalt Ridge tar-sand deposits  
14 p0193 A77-27347
- LOWERY, G. W.**  
A practical solar concentrator  
14 p0171 A77-23657  
Solar cooling of a Florida welcome station - A demonstration  
15 p0294 A77-35319  
Solar cooling of a Florida Welcome Station - A demonstration  
16 p0476 A77-48973
- LOWERY, J. E.**  
Solar absorption characteristics of several coatings and surface finishes  
[NASA-TM-X-3509] 14 p0229 N77-20567
- LOWES, T. M.**  
Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames  
[PB-259911/6] 14 p0234 N77-20639
- LOWI, A.**  
Fuel economy potential of a combined engine cooling and waste heat driven automotive air-conditioning system  
13 p0020 A77-12665
- LOWMAN, P. D.**  
Space technology in the discovery and development of mineral and energy resources  
16 p0526 N77-30289
- LOWNEY, J. E.**  
The integral formulation of the thermoelectric figure-of-merit - Effects of lattice thermal conduction  
13 p0042 A77-12850
- LU, C.-L.**  
Influence of coal type and drying upon MHD power plants and components  
14 p0140 A77-21231
- LU, D. C.**  
Heat pipe heat exchanger design considerations  
13 p0031 A77-12765
- LUCAS, G. G.**  
Assessment of the role of the liquefied petroleum gas (LPG) engine in stage carriage service vehicles  
[TT-7605] 16 p0519 N77-29320
- LUCE, R. G.**  
Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks  
[PB-262789/1] 15 p0371 N77-25551
- LUCRY, S. F.**  
Santa Clara, California, community center, commercial solar demonstration legal alternatives, implications, and financing of solar heating and cooling by a municipal corporation  
[SAR/1083-76/1] 15 p0394 N77-27549
- LUCHTER, S.**  
Comparing alternative methods of improving fuel economy  
16 p0443 A77-48702  
Improving automobile fuel economy with advanced transmissions  
16 p0444 A77-48704
- LUDTKE, P. E.**  
Helium research in support of superconducting power transmission  
[PB-265076/0] 15 p0390 N77-27326
- LUDWICK, J. D.**  
Mercury emissions from geothermal power plants  
15 p0289 A77-34428
- LUECKE, E. E.**  
Heat pipe materials compatibility  
[NASA-CR-135069] 13 p0103 N77-12182



- Flight data analysis and further development of variable-conductance heat pipes  
[NASA-CR-137953] 13 p0118 A77-14374
- LUKHBHANN, W.  
Energy in the household - Comparison of heating costs and prognosis concerning the consumption of energy until 1985 13 p0015 A77-12059
- LUFT, W.  
Ultralightweight solar array for Naval Sea Control Systems 13 p0040 A77-12828  
Radiation effects on high efficiency silicon solar cells 13 p0064 A77-18072  
Radiation effects on high efficiency silicon solar cells 16 p0416 A77-42892
- LUKACHINSKI, J.  
The 1985 technical coefficients for inputs to energy technologies [BNL-50532] 14 p0231 A77-20583  
Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil [BNL-50538] 15 p0369 A77-24998
- LUKASH, V. E.  
Processing of experimental data with the U-25 facility with the aid of a data measuring system 15 p0269 A77-32521  
Determination of the non-equilibrium MHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor 15 p0326 A77-39537
- LUKENS, L. L.  
Parametric studies of the thermal trap flat plate collector 13 p0068 A77-18443
- LUKES, T.  
Research on the application of solar energy to the food drying industry [PB-267210/3] 16 p0530 A77-30635
- LUMSDAINE, E.  
Economics of solar heating with homeowner-type financing 16 p0501 A77-50210
- LUND, J. W.  
The utilization and economics of low temperature geothermal water for space heating 13 p0030 A77-12756
- LUNDEGAW, C. D.  
Sandia Laboratories energy programs [SAND-77-0034] 16 p0555 A77-33629
- LUNDHOLM, J. G.  
NASA thermionic-conversion program 13 p0043 A77-12863
- LUNDHOLM, S. G. K.  
The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report [SAE PAPER 770081] 16 p0424 A77-44559
- LUNDIN, C. E.  
Some useful relationships between the physical and thermodynamic properties of metal hydrides 13 p0033 A77-12776
- LUNT, E. E.  
Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment [PB-269270/5] 16 p0561 A77-34058
- LUPTON, W.  
A multi-megajoule inertial-inductive energy storage system 15 p0299 A77-36292
- LUSHIKU, E. H.  
Ellipsometry in the study of selective radiation-absorbing surfaces 16 p0406 A77-41581
- LUSTENADDER, E. L.  
Development of a high performance and lightweight hybrid flywheel/battery powered electric vehicle drive 14 p0160 A77-22898  
Flywheel module for electric vehicle regenerative braking 16 p0447 A77-48728
- LUTTRELL, C. K.  
Site Data Collection System for solar energy applications 16 p0480 A77-49014
- LYNCH, F. E.  
Some useful relationships between the physical and thermodynamic properties of metal hydrides 13 p0033 A77-12776
- LYNN, S.  
Evaluation of a chemical heat storage system for a solar steam power plant 16 p0460 A77-48840
- LYON, D.  
Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3 [PB-268492/6] 16 p0548 A77-32615
- LYTLE, J. K.  
Molecular gas performance of a disk generator with swirl 15 p0326 A77-39534
- LYTLE, R. J.  
Monitoring fluid flow by using high-frequency electromagnetic probing [UCRL-51979] 13 p0120 A77-14393
- M**
- MA, F. S. T.  
Planning models for the assessment of advanced energy storage systems 13 p0105 A77-12504
- MA, Y. Y.  
Photovoltaic properties of n-CdS/p-CdTe heterojunctions prepared by spray pyrolysis 14 p0198 A77-29023  
Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions 15 p0259 A77-30741
- MAAS, J. P.  
Telluric mapping over the Mesa Geothermal Anomaly, Imperial Valley, California [PB-262828/7] 15 p0355 A77-23593
- MACDONALD, G. A.  
The Hawaii geothermal project, initial phase 2 progress report [PB-263120/8] 15 p0355 A77-23594
- MACDONALD, B. C.  
Use of radar in geology 13 p0018 A77-12256
- MACEDO, I. C.  
Grain drying in stationary bins with solar heated air 13 p0019 A77-12411
- MACFARLAND, W. J.  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results [NASA-CR-134949-VOL-2-PT-4] 15 p0380 A77-26635
- MACIOLEK, B. B.  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project [NASA-CR-149242] 13 p0105 A77-12513
- MACKEY, D. B.  
Prototype hydrogen automobile using a metal hydride 15 p0282 A77-33398  
Automotive hydride tank design 15 p0282 A77-33399  
Prototype hydrogen automobile using a metal hydride 14 p0244 A77-21636  
Automotive hydride tank design 14 p0244 A77-21637
- MACKEHEIE, J. D.  
Transparent glass honeycomb structures for energy loss control [SAN/1084-75/1] 14 p0248 A77-21673
- MACKLIN, B. L.  
Electrostatic energy storage [ORNL-TN-5529] 15 p0364 A77-24598
- MACPHERSON, E. G.  
IEA energy simulation model: A framework for long-range US energy analysis [OBAU-125] 13 p0122 A77-14594
- MACRISS, R. A.  
Selecting refrigerant-absorbent fluid systems for solar energy utilization 14 p0168 A77-23448
- MACURA, R.  
Gasification and generation of electricity 15 p0308 A77-36812

- MADDALONE, D. V.**  
Energy and economic trade offs for advanced technology subsonic aircraft  
14 p0201 A77-29471
- MADDOCKS, B. B.**  
A new concept for the manufacture of low sulfur fuels and chemicals from coal  
14 p0192 A77-27295
- MADWELL, D. G.**  
Transportation energy conservation data book [ORNL-5198]  
13 p0086 N77-10643
- MADWELL, J. P.**  
Solar power system with gallium arsenide solar cells  
[AIAA PAPER 77-519]  
14 p0174 A77-23932
- MAEKAWA, Y.**  
Energy conversion and storage by CDE /concentration difference energy/ engine and system  
16 p0459 A77-48831
- MAEVSKII, V. A.**  
Anomalous current-voltage characteristics observed during reactor tests of multielement thermionic assemblies  
13 p0018 A77-12361
- MAGEE, C. B.**  
Some useful relationships between the physical and thermodynamic properties of metal hydrides  
13 p0033 A77-12776
- MAGEE, E. M.**  
Evaluation of pollution control in fossil fuel conversion processes  
[PB-255842/7]  
13 p0125 N77-14638
- MAGID, L. H.**  
The current status of the U.S. Photovoltaic Conversion Program  
14 p0147 A77-21782
- MAGLICH, B. C.**  
The magma high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794  
Design considerations for a magma advanced fuel fusion reactor  
15 p0334 A77-39747  
Symposium on Clean Fusion, 1st, Washington, D.C., April 30, 1976, Proceedings  
16 p0435 A77-47355  
The 1976 status of the Magma program of controlled fusion  
16 p0435 A77-47360  
Advanced fuel fusion experimentation with Migmacells II and III - Orbit diagnostics and lifetime measurements  
16 p0436 A77-47362  
Fusion products detection system in Migmacell II  
16 p0436 A77-47363  
Unified criterion for proximity to controlled fusion  
16 p0436 A77-47369
- MAGNIEN, H.**  
Utilizing alternative energy sources in France  
15 p0296 A77-35923
- MAGNOLI, D.**  
Solar energy prospects for electric power generation in Brazil  
13 p0037 A77-12805  
Solar powered steam generation  
16 p0459 A77-48832
- MAHAJAN, G. K.**  
Bibliography on solar cells  
14 p0195 A77-28067
- MAHAJAN, O. P.**  
Differential scanning calorimetry studies on coal. II - Hydrogenation of coals  
13 p0070 A77-18583  
Reactivity heat-treated coals in hydrogen  
14 p0198 A77-28777  
Concurrent carbon gasification and carbon deposition in chars  
16 p0508 A77-51590
- MAHDJURI, F.**  
The Philips energy-experimentation house - Results and experience  
15 p0336 A77-39982  
Calculation and optimization of solar-energy systems which provide hot water  
15 p0337 A77-39988
- MAHEPKY, T.**  
Demonstration testing of a Vuilleumier cryocooler with an integral  
[AD-A042786]  
16 p0547 N77-32599
- MAHLOCH, J. L.**  
Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges  
[PB-256691/7]  
13 p0133 N77-15540
- MAHONY, F. O.**  
Integration of high temperature thermal energy storage into a solar thermal Brayton cycle power plant  
16 p0461 A77-48842
- MAJANI, L.**  
Physical and biological aspects of thermal pollution in sea water  
[ISS-L-75/14]  
13 p0109 N77-12560
- MAIER, H.-H.**  
A system model for the investigation of alternative energy strategies  
13 p0080 A77-19181
- MAIER, K. H.**  
Technical and economic aspects of industrial power-heat coupling. I  
15 p0334 A77-39674
- MALLIOT, H. J.**  
Innovative Aircraft Design Study (IADS) task 2, volume 1  
[AD-A041234]  
16 p0531 N77-31141
- MAJUNDAR, D. P.**  
The aqueous homogeneous reactor as a source of hydrogen and of process heat  
15 p0274 A77-33329
- MAKAROV, V. I.**  
Cross structural plan of the earth's crust and the problem of the manifestation of its plutonic elements on the surface (Tyan-Shan and Turan plate as examples)  
[NASA-TT-F-16938]  
13 p0117 N77-13590
- MAKHIGANI, A.**  
Investment planning in the energy sector  
[LBL-4474]  
13 p0125 N77-14948
- MAKSUDOV, T. M.**  
Study of an absorption solar refrigeration unit functioning on a round-the-clock basis  
15 p0316 A77-37772  
Investigation of solar absorption cooler for round-the-clock operation  
16 p0437 A77-47428
- MALEVSKII, I. U. M.**  
Use of solar water-heating installations in the combined cycle of a thermal electric power plant  
14 p0152 A77-21825  
Potentialities of electric energy production by means of thermoelectric generators  
14 p0154 A77-21847
- MALIC, D.**  
Some aspects of heat and mass transfer in geothermal wells  
14 p0175 A77-24209
- MALIKOV, H. H.**  
Determination of the non-equilibrium MHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor  
15 p0326 A77-39537  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- MALIUZHONOK, G. P.**  
Processing of experimental data with the U-25 facility with the aid of a data measuring system  
15 p0269 A77-32521
- MALKIN, L. S.**  
Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3  
[PB-268492/6]  
16 p0548 N77-32615
- MALLAN, G. M.**  
Energy and resource recovery from solid wastes  
16 p0434 A77-47215
- MALLINSON, J. R.**  
Thermodynamic constraints, effective temperatures and solar cells  
14 p0147 A77-21779  
Meteorological effects on solar cells  
15 p0338 A77-40149

- MALLON, B. G.  
Reactivity of oil shale carbonaceous residue with oxygen and carbon dioxide  
[UCRL-77829] 13 p0123 N77-14596
- MALONE, D. W.  
Energy: The policy planning framework in state governments. Volume 1: Summary report  
[PB-254466/6] 13 p0089 N77-10665  
Energy: The policy planning framework in state governments. Volume 2: Appendices  
[PB-254467/4] 13 p0089 N77-10666
- MALTESE, J.  
Availability of potential coal supply through 1985 by quality characteristics  
[PB-256680/0] 13 p0121 N77-14573
- MALTHOUSE, N. S.  
Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643
- MALUZHONOK, G. P.  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility  
14 p0142 A77-21257
- MALVER, P. S.  
The application of wind power systems to the Minnesota Power and Light Company  
16 p0490 A77-49092
- MANCINI, W. A.  
Thin film solar acceptors  
13 p0072 A77-19053
- MANCINI, T. R.  
A comparison of solar absorption air conditioning systems  
14 p0158 A77-22647
- MANDAS, W.  
Design and testing of planar solar collectors  
14 p0164 A77-23298
- MANDELKORN, J.  
Solar cell array for concentrated sunlight  
16 p0460 A77-48836
- MANDEVILLE, R. T.  
Fuel gas from landfill  
15 p0314 A77-37661
- MANGAN, M. F.  
Development cost effective battery electric road vehicles  
14 p0160 A77-22889
- MANIAKHIN, S. M.  
Optimization of current source operation in pulse mode  
[IAP PAPER 76-255] 13 p0003 A77-10952
- MANIFACIER, J. C.  
Efficient sprayed In203:Sn n-type silicon heterojunction solar cell  
16 p0503 A77-50292
- MANISCALCO, J. A.  
Development scenario for laser fusion  
[UCRL-76980] 14 p0216 N77-18575  
Conceptual design study for a laser fusion hybrid  
[UCRL-78682] 15 p0397 N77-27926
- MANW, J. R.  
Underground gasification of coal: A National Coal Board reappraisal. 1976  
13 p0044 A77-12926
- MANNE, A. S.  
Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/  
13 p0013 A77-11524  
U.S. options for a transition from oil and gas to synthetic fuels  
15 p0335 A77-39836  
An econometric analysis of energy over the next 75 years  
16 p0414 A77-42637  
US options for a transition from oil and gas to synthetic fuels  
14 p0247 N77-21661
- MANNING, G. E.  
ERDA's gas turbine development program for the next decade  
13 p0011 A77-11324  
The high temperature water cooled gas turbine in combined cycle with integrated low Btu gasification  
[ASME PAPER 77-JPGC-GT-7] 16 p0509 A77-51624
- MANNING, J. A.  
Environmental assessment of geopressured waters and their projected uses  
[PB-268289/6] 16 p0544 N77-32579
- MANSOORI, G. A.  
Prospects for solar energy utilization in Iran - Photothermal methods  
13 p0013 A77-11532
- MANVI, R.  
Benefits of hydrogen production research  
13 p0032 A77-12768  
Hydrogen use projections and supply options  
15 p0285 A77-33418  
Hydrogen use projections and supply options  
14 p0247 N77-21658
- MANYIMO, S. B.  
Feasibility study of an Integrated Energy/Utility System at the University of Florida  
16 p0449 A77-48751
- MARCHANT, L. C.  
Field experiment of in-situ oil recovery from a Utah tar sand by reverse combustion  
14 p0193 A77-27348
- MARCHELLO, J. M.  
Control of air pollution sources  
16 p0419 A77-43522
- MARCHETTI, C.  
Primary energy sources for hydrogen production  
13 p0011 A77-11335  
On strategies and fate  
16 p0402 A77-41423
- MARCOUX, L. S.  
Development program for solid electrolyte batteries  
[PB-260719/0] 15 p0341 N77-22398
- MARCRUM, L. S.  
Magma energy research project, volume 2, no. 2  
[SAND-76-0264-VOL-2-NO-2] 15 p0372 N77-25638
- MARCUM, A. L.  
Design of minimum-weight diffusion batteries  
[PB-266217/9] 16 p0518 N77-28645
- MARCUS, B.  
Transmitter experiment package for the communications technology satellite  
[NASA-CR-135035] 15 p0360 N77-24332
- MARENA, M.  
Combined production of electrical power and desalinated water by nuclear power plants  
15 p0255 A77-30100
- MARGARITIS, P. J.  
Operation of the Westinghouse Coal Gasification Process Development Unit  
13 p0023 A77-14689  
Development of the Westinghouse coal gasification process - A status report  
16 p0446 A77-48722
- MARGOLIS, H.  
Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases  
[PB-263523/3] 15 p0354 N77-23518
- MARIANOWSKI, L. B.  
Production of methane using offshore wind energy  
13 p0026 A77-12722
- MARIETTI, P.  
An automatic solar disk tracking system for incident energy measurements  
14 p0138 A77-20749
- MARINESCU, M.  
Theoretical and experimental validation of new sources of electrical energy  
14 p0176 A77-24457
- MARKANT, H. P.  
A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- MARKHAM, D. H.  
Coupled electrical and fluid calculations in the cross plane in linear MHD generators  
15 p0329 A77-39557
- MARKINA, A. P.  
Study of cathode spots in the presence of slag films on the electrodes of an open-cycle MHD generator  
13 p0053 A77-15005
- MARKMAN, M. A.  
Investigation of energy parameters of low-temperature ring thermopiles  
16 p0409 A77-41902

- MARSHALL, P.  
Economic data for a 50,000 BPD Lurgi/Buhr gas shale oil plant  
15 p0300 A77-36331
- MARSHALL, V. A.  
Tokamak experimental power reactor  
[ASME FAFIF 76-WA/NE-11]  
14 p0188 A77-26496
- MARSH, R.  
Evaluation of wind-energy sites from aeolian geomorphologic features mapped from LANDSAT imagery. First results  
[ERDA/NSF-00598/75/T1]  
14 p0218 N77-18667
- MARSHALL, E.  
Storage of thermal energy in molten salts and metals  
[NASA-TT-F-17412]  
14 p0220 N77-19574
- MARSH, D. P.  
The next-generation subsonic transport  
[SAE FAFIF 1127]  
13 p0016 A77-12195
- MARSH, R. E., JR.  
Oil and fat absorbing polymers  
[NASA-CASE-NPO-11609-2]  
16 p0532 N77-31308
- MARSH, S. L.  
The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California  
[PB-254449/2]  
13 p0092 N77-10720
- MARSH, W. D.  
A new approach to planning with gas turbines  
[ASME PAPER 77-JPGC-GT-3]  
16 p0509 A77-51623
- MARSHALL, B. W.  
Silicon solar photovoltaic power stations  
[AIAA 77-1021]  
16 p0404 A77-41563
- MARSHALL, K. R.  
Use of Lexan and Kapton honeycombs to increase solar collector efficiency  
13 p0068 A77-18448
- Development of plastic honeycomb flat-plate solar collectors  
[SAE/1081-76/1]  
15 p0372 N77-25640
- MARSHALL, S. J.  
Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire  
[AD-A031803]  
14 p0228 N77-20393
- MARSHALL, W.  
Energy research in the UK  
13 p0055 A77-15812
- MARSHALL, W. P.  
Fuel consumption, emissions, and power characteristics of the 1975 Ford 140-CID automotive engine, experimental data  
[PB-261771/0]  
15 N77-22725
- MARSH, P. V.  
Trends in refinery capacity and utilization: Petroleum refineries in the United States; foreign refinery exporting centers  
[PB-256566/3]  
13 p0132 N77-15523
- MARSTON, C. R.  
Coal fired non-equilibrium closed cycle MHD power plant system since ECAS  
15 p0332 A77-39576
- MHD generator investigations  
[AD-A032790]  
15 p0358 N77-23952
- MARSTON, P. G.  
Superconducting magnet development for the MHD program  
15 p0331 A77-39569
- MARTEL, C.  
Market evaluation study: Solar heating and domestic hot water heating in DoD buildings  
[AD-A042178]  
16 p0546 N77-32597
- MARTEN, J. B.  
Winkler technology for clean fuels from coal  
15 p0301 A77-36337
- An economic assessment of fuel gas from water hyacinths  
15 p0314 A77-37663
- MARTIN, A.  
Method of investigation, experimental results, and optimization criteria for photoelectrochemical converters  
14 p0151 A77-21814
- MARTIN, A. W.  
Evaluation of propulsive lift enhancement and variable cycle engines for advanced tactical aircraft  
[AIAA PAPER 77-885]  
15 p0321 A77-38575
- MARTIN, P. J.  
NOx from fuel nitrogen in two-stage combustion  
16 p0439 A77-48169
- MARTIN, G.  
Thermostatics and thermokinetics of a flat plate solar collector with constant heat capacity  
13 p0073 A77-19057
- MARTIN, G. B.  
Environmental aspects of low Btu gas combustion  
16 p0440 A77-48178
- MARTIN, J.  
Recent experimental studies of the interaction of potassium seed with coal slag in a direct-coal fired MHD generator  
14 p0141 A77-21250
- Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system  
15 p0331 A77-39570
- MARTIN, J. D.  
Computer graphics demonstration: Area coal availability studies  
[PB-267923/1]  
16 p0541 N77-31824
- MARTIN, J. P.  
A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- MARTIN, J. H., JR.  
Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164]  
15 p0383 N77-26675
- MARTIN, J. R.  
Description of a new photoelectrochemical generator  
14 p0150 A77-21812
- MARTIN, K. R.  
Regional energy availability from conversion of solid waste  
15 p0304 A77-36433
- MARTIN, M. S.  
Photovoltaic properties of GaSe and InSe junctions  
15 p0289 A77-34117
- MARTIN, T. K.  
Transportation programming, economic analysis, and evaluation of energy constraints  
[PB-262878/2]  
15 p0370 N77-25018
- MARTIN, W. P.  
Energy supply to the year 2000: Global and national studies  
16 p0428 A77-46093
- MARTINET, J.  
Thermodynamic conversion systems as applied to solar energy  
14 p0148 A77-21783
- MARTINEZ-SANCHEZ, H.  
Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator  
15 p0329 A77-39554
- Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators  
15 p0329 A77-39555
- Wind energy conversion  
[PB-256198/3]  
13 p0115 N77-13552
- Wind energy conversion  
[PB-268718/4]  
16 p0559 N77-33667
- MARTINEZ, I.  
Development of space applications of heat pipes at Aerospatiale  
13 p0120 N77-14390
- MARTINI, W. R.  
Self-starting, intrinsically controlled Stirling engine  
13 p0041 A77-12844
- MARTINO, P. J.  
Performance characteristics of solid lithium-aluminum alloy electrodes  
13 p0007 A77-11107
- Review of electrode designs and fabrication techniques for lithium-aluminum/iron sulfide cells  
13 p0025 A77-12713
- MARTINS, O. R.  
Design phase utility analysis for gas turbine and combined cycle plants  
[PB-256665/1]  
13 p0115 N77-13553

- MARTINSEN, W. E.  
Small scale tests on control methods for some  
liquefied natural gas hazards  
[AD-A033522] 15 p0341 N77-22293
- MARTS, M. E.  
Electric power development in the Pacific  
Northwest Region: Institutional commitments and  
alternatives, phase 1  
[PB-262382/5] 15 p0348 N77-22671
- MARU, H. C.  
Molten salt thermal energy storage systems: Salt  
selection  
[COO-2888-1] 15 p0365 N77-24609
- MARWITZ, J. D.  
Evaluation of wind-energy sites from aeolian  
geomorphologic features mapped from LANDSAT  
imagery. First results  
[ERDA/NSF-00598/75/T1] 14 p0218 N77-18667
- MAS, L.  
Water electrolysis under pressure - Improvement of  
energy efficiency by temperature increase  
15 p0277 A77-33360  
Water electrolysis under pressure: Improvement of  
energy efficiency by temperature increase  
14 p0238 N77-21594
- MASAPATI, G. B.  
Electric power fluctuations in a MHD generator  
15 p0269 A77-32432
- MASICA, W. J.  
Thermal storage for electric utilities  
[AIAA 77-1009] 16 p0403 A77-41556
- MASLOV, V. G.  
Theoretical aspects of optimization of aviation  
gas turbine engine design variables  
13 p0063 A77-17762  
Influence of the intended use of an aircraft on  
the optimal parameters of gas-turbine power plants  
15 p0266 A77-32086
- MASON, R. Z.  
Evaluation of the Lawrence Livermore Laboratory  
in-situ coal gasification concept  
15 p0300 A77-36332
- MASSA, C. O.  
Cassava fuel alcohol in Brazil  
16 p0444 A77-48707
- MASSIE, L. D.  
Hardened solar photovoltaics  
[AIAA PAPER 77-484] 14 p0172 A77-23904
- MASOGLIA, H. F.  
RANN utilization experience (case studies 32  
through 41)  
[PB-263683/5] 15 p0370 N77-25027
- MASSON, L.  
Electric delivery vans above the 45th parallel in  
North America  
14 p0162 A77-22917
- MAST, L. R.  
Application of solar principles in designing a low  
cost system for warehouse heating  
16 p0476 A77-48969
- MASTERSON, K. D.  
Investigation of high temperature performance of  
thin film, solar-thermal energy converters  
[PB-265554/6] 16 p0516 N77-28613
- MASUDA, T.  
Experiment on MHD generator with a large-scale  
superconducting magnet /ETL Mark V/  
13 p0049 A77-13728  
Experiment on MHD generator with a large scale  
superconducting magnet /ETL Mark V/  
15 p0325 A77-39527
- MATHE, P.  
Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509  
Factors which maximize the efficiency of Cr-p-Si  
Schottky /HIS/ solar cells  
15 p0288 A77-34103
- MATHE, G. R., JR.  
Performance of an evacuated tubular collector  
using non-imaging reflectors  
16 p0472 A77-48940
- MATHEWS, C. D.  
Upper limit of efficiency for photovoltaic solar  
cells  
16 p0399 A77-40568
- MATHEW, H.  
The atypical Mathew solar house at Coos Bay, Oregon  
16 p0405 A77-41576
- MATHIAN, G.  
Method of investigation, experimental results, and  
optimization criteria for photoelectrochemical  
converters  
14 p0151 A77-21814
- MATHIEU, J. P.  
Development of space applications of heat pipes at  
Aerospatiale  
13 p0120 N77-14390
- MATHIS, D. A.  
Hydrogen technology for energy  
14 p0180 A77-25824
- MATHUR, H. B.  
Methanol - A clean burning fuel for automobile  
engines  
14 p0205 A77-29930
- MATHUR, R. B.  
Transport systems guarantee efficient utilization  
of energy resources  
13 p0053 A77-15048
- MATIDA, H.  
Gasification of coals treated with non-aqueous  
solvents. I - Liquid ammonia treatment of a  
bituminous coal  
14 p0198 A77-28778
- MATLICK, J. S.  
Summary of 1976 geothermal drilling - Western  
United States  
15 p0286 A77-33522
- MATSON, L. W.  
New turbodrill for geothermal drilling  
16 p0456 A77-48810
- MATSON, S. L.  
Progress on the selective removal of H<sub>2</sub>S from  
gasified coal using an immobilized liquid membrane  
15 p0318 A77-38146
- MATSUMOTO, H.  
Ceramic thin film CdTe solar cell  
14 p0135 A77-19635
- MATSUMOTO, S.  
HIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective  
coating  
16 p0499 A77-49494
- MATSUMAMI, H.  
HIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective  
coating  
16 p0499 A77-49494
- MATTERSDORFF, B.  
The wind and its effect on the heating requirements  
13 p0009 A77-11266
- MATTHEWS, B.  
Design and field test of a steam powered downhole  
geothermal pump  
16 p0456 A77-48806
- MATTHEWS, B. D.  
The formation of nitrogen oxides from fuel nitrogen  
[PB-252462/7] 13 p0092 N77-10717
- MATTINGLY, S. R.  
Stratospheric heating due to absorption of solar  
radiation by NO<sub>2</sub>  
13 p0013 A77-11568
- MATTOX, D. H.  
Optical materials for solar energy applications  
[SAND-76-5141] 14 p0224 N77-19628
- MATTSON, J. S.  
Classification of oils by the application of  
pattern recognition techniques to infrared spectra  
[AD-A039387] 16 p0531 N77-30841
- MATULA, R. A.  
Solid waste incineration and energy recovery in  
hospitals  
15 p0272 A77-33283
- MATZKE, D. J.  
Energy resources alternatives competition  
[COO-2698-1] 14 p0224 N77-19635
- MAUGHNER, H. D.  
Optimization and characteristics of a sailing  
windmill rotor  
[PB-259898/5] 14 p0234 N77-20622  
Optimization and characteristics of a sailing  
windmill rotor  
[NSF/RANN/GI-41891/PB/75/4] 16 p0558 N77-33652
- MAURER, K. H.  
A parametric utility comparison of coal and  
nuclear electricity generation  
[PB-266064/5] 16 p0523 N77-29634
- MAURER, W. C.  
New turbodrill for geothermal drilling  
16 p0456 A77-48810

- HAUTREFF, M.**  
High-efficiency thin silicon solar cells  
14 p0148 A77-21786
- MAXWELL, C. D.**  
Development of a baseline reference design for an open cycle MHD power plant for commercial service  
14 p0140 A77-21232  
Consideration of three-dimensional effects in MHD power generators  
14 p0142 A77-21261  
Coupled electrical and fluid calculations in the cross plane in linear MHD generators  
15 p0329 A77-39557  
Calculation of end effects in open-cycle MHD power generators  
15 p0329 A77-39558  
Status of the reference dual-cycle MHD-steam power plant  
15 p0332 A77-39577
- MAXWELL, J. B.**  
Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra  
15 p0260 A77-31262
- MAY, D.**  
Discovery of reaction sequences for thermochemical water splitting  
15 p0275 A77-33343  
Discovery of reaction sequences for thermochemical water splitting  
[AD-A029959]  
14 p0228 N77-20191  
Discovery of reaction sequences for thermochemical water splitting  
14 p0238 N77-21575
- MAY, B. J., JR.**  
Potential improvements in engine performance using a variable geometry turbine  
15 p0340 N77-22141
- MAY, W. B., JR.**  
Analysis of thermal performance of 'Solaris' water-trickle solar collector  
[ASME PAPER 76-WA/SOL-21]  
14 p0190 A77-26526  
Performance and analysis of 'Solaris' water-trickle solar collector  
16 p0472 A77-48939  
Performance and analysis of SOLARIS water-trickle solar collector  
[CONF-760821-9]  
14 p0232 N77-20599  
Analysis of thermal performance of Solaris water-trickle solar collector  
[CONF-761107-17]  
15 p0382 N77-26668  
Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1]  
15 p0382 N77-26669
- MAYCOCK, P. D.**  
Prospectus on commercialization of solar heating and cooling systems  
16 p0470 A77-48920  
Incentives and barriers to the development of solar energy  
16 p0494 A77-49119
- MAYER, E. R.**  
Present state and perspective of solar energy applications in Mexico  
16 p0469 A77-48911
- MAYER, H. J.**  
LTA - Recent developments  
13 p0061 A77-17021
- MAYNARD, O. E.**  
Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere  
16 p0464 A77-48875
- MAYO, L. R.**  
Some legal-institutional implications of offshore wind energy conversion systems  
16 p0489 A77-49086
- MAYSTEE, D.**  
On the theory and solar application of inductive grids  
16 p0419 A77-43556
- MAZARAKIS, E.**  
The mega high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794
- MAZARAKIS, E. G.**  
Advanced fuel fusion experimentation with Mignacells II and III - Orbit diagnostics and lifetime measurements  
16 p0436 A77-47362  
Fusion products detection system in Mignacell II  
16 p0436 A77-47363
- MAZIUK, J.**  
Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process  
13 p0023 A77-12691
- MAZULEVSKII, E. A.**  
Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte  
13 p0055 A77-15815
- MAZUNDER, H.**  
Experimental demonstration of an iron chloride thermochemical cycle for hydrogen production  
13 p0032 A77-12772
- MAZUR, I. I.**  
Increasing the electrical strength of the interelectrode gap in an MHD generator  
16 p0428 A77-46091
- MCALEER, R. P., III**  
The performance of hydrogen-injected reciprocating engines  
13 p0033 A77-12780  
Hydrogen energy conversion  
[AD-A030370]  
14 p0218 N77-18601
- MCCARTER, E. E.**  
Liquid fluidized bed heat exchanger - Horizontal configuration experiments and data correlations  
16 p0455 A77-48799
- MCBETH, R. L.**  
HYCOS - A solar heating, cooling and energy conversion system based on metal hydrides  
13 p0029 A77-12740
- MCCBRIDE, E. J.**  
Modeling aspects of a gas turbine solar-electric power system  
15 p0318 A77-38210  
Solar thermal conversion to electricity utilizing a central receiver, open cycle gas turbine design  
16 p0461 A77-48844
- MCCBRIDE, P. L.**  
GaAs double-heterostructure photodetectors  
16 p0426 A77-45304
- MCCABE, M.**  
Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
[PB-257770/8]  
14 p0208 N77-16452
- MCCABBIA, J. L.**  
High speed superconducting generator  
14 p0144 A77-21383  
High power study, superconducting generators  
[AD-A031620]  
15 p0342 N77-22408
- MCCANN, J. D.**  
Airborne and mobile ground level measurements of pollutants in the sphere of influence of a coal-fired electric generating station  
16 p0504 A77-51135
- MCCALLISTER, E. A.**  
Coal gasification combined-cycle pilot plant system analysis  
16 p0446 A77-48724
- MCCALLUM, B.**  
Can Canada harness the wind  
13 p0053 A77-15047
- MCCANN, C. R.**  
Combustion of pulverized, solvent-refined coal  
[ASME PAPER 76-WA/PU-6]  
14 p0185 A77-26456
- MCCANN, J.**  
Hydrogen and electricity from water and light  
16 p0430 A77-46609
- MCCANN, J. P.**  
The photosynthetic production of hydrogen  
13 p0075 A77-19077  
The photosynthetic production of hydrogen  
15 p0278 A77-33368  
The photosynthetic production of hydrogen  
14 p0239 N77-21602
- MCCARTHY, D. J.**  
Evaluation of the practical aspects of the use of coal derived synthetic fuels  
[ASME PAPER 76-WA/APC-6]  
14 p0184 A77-26411

- MCCARTHY, H. E.  
Development of the modified in situ oil-shale process  
14 p0193 A77-27342
- MCCARTHY, P.  
Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864
- MCCARTHY, R. L.  
Industrial energy conservation through integration of thermal energy storage into process energy dynamics  
13 p0028 A77-12733
- MCCARTNEY, J. K.  
The Garrett oil-from-waste process and resource recovery system  
15 p0293 A77-35162
- MCCARTY, P. L.  
Heat treatment of refuse for increasing anaerobic biodegradability  
[PB-252924/6]  
13 p0101 N77-11577
- MCCARTY, T. R.  
Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164]  
15 p0383 N77-26675
- MCCLENAHAN, S.  
Coal liquefaction with soluble transition-metal complexes  
13 p0070 A77-18584
- MCCLENAHAN, D. L.  
Minimum Energy Building - The first winter's operation  
16 p0496 A77-49144
- MCCUNEY, W. R.  
Gulf Stream OTEC resource potential and environmental impact assessment overview  
16 p0485 A77-49048
- MCCURE, T. A.  
Systems study of fuels from sugar cane, sweet sorghum, and sugar beets  
[TID-27032]  
14 p0211 N77-17570  
Systems study of fuels from sugarcane, sweet sorghum, sugar beets, and corn  
[TID-27336]  
15 p0377 N77-26324
- MCCONE, A. I.  
Factors influencing the economics of large-scale in situ coal gasification operations  
15 p0306 A77-36765
- MCCONNELL, R.  
Experimental evaluation of a solar house heating system in Quebec  
16 p0475 A77-48968
- MCCONNELL, R. D.  
An experimental 200 kW vertical axis wind turbine for the Magdalen Islands  
13 p0044 A77-12874
- MCCONNELL, R. W.  
Energy storage propulsion system for advanced concept train  
14 p0200 A77-29467
- MCCORKLE, K. B.  
Water splitting - A progress report  
15 p0274 A77-33330  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- MCCORMICK, J. R.  
Solar silicon via improved and expanded metallurgical silicon technology  
[NASA-CR-153415]  
16 p0528 N77-30606
- MCCOY, L. E.  
Development status of lithium-silicon-iron sulfide load-leveling batteries  
13 p0026 A77-12714  
Development status of lithium-silicon/iron sulfide load leveling batteries  
16 p0448 A77-48741
- MCCOY, P. P.  
Optimal drawdown strategy for strategic petroleum reserves  
[PB-265838/3]  
16 p0512 N77-28569
- MCCOY, B. A.  
Design development of advanced composite flywheels  
[AD-A030712]  
14 p0214 N77-18230
- MCCOY, T. B.  
Solid waste as an energy source for the northeast  
[BNL-50559]  
15 p0352 N77-23012
- MCCREIGHT, L. E.  
Industrial development in zero-G  
15 p0295 A77-35812
- MCCULLOCH, C. M.  
Applying computer-drawn maps of geologic data to analysis of mining problems  
[PB-255497/0]  
13 p0096 N77-11518  
Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia  
[PB-266769/9]  
16 p0527 N77-30589
- MCCULLOCH, D. E.  
Small electric vehicle considerations in view of performance and energy usage  
13 p0024 A77-12698
- MCCUMBER, W. H., JR.  
Solar system market capture in the climato-economic regions of the United States  
16 p0493 A77-49116
- MCDONALD, G.  
Fundamental studies of black chrome for solar collector use  
16 p0498 A77-49160  
Optimized selective coatings for solar collectors  
[NASA-TN-X-73498]  
13 p0097 N77-11529
- MCDONUGALL, A. O.  
Fuel cells  
14 p0180 A77-25875
- MCELROY, A.  
System study of fuels from grains and grasses  
[DSE/3729-1]  
16 p0519 N77-29318
- MCELROY, J.  
A hydrogen-halogen energy storage system for electric utility applications  
16 p0457 A77-48818
- MCEVER, W.  
The Page-Jackson Elementary School solar heating and cooling system  
16 p0462 A77-48851
- MCFARLAND, B. L.  
Commercial applications of solar total energy systems  
16 p0468 A77-48904
- MCFARLAND, B. D.  
Extracting energy from hydraulically-fractured geothermal reservoirs  
13 p0030 A77-12757  
Simulation analysis of passive solar heated buildings - Preliminary results  
16 p0406 A77-41582  
Extracting energy from hydraulically-fractured geothermal reservoirs  
[LA-UR-76-848]  
14 p0221 N77-19598
- MCFARLANE, S. B.  
Epitaxial silicon technology for low-cost solar cells  
[PB-262396/5]  
15 p0374 N77-25663
- MCGRAW, T.  
Urban transportation technology  
15 p0324 A77-39467
- MCGEORGE, A.  
Economic feasibility: Fuel grade methanol from coal  
[TID-27156]  
15 p0345 N77-22630
- MCGINNESS, H.  
Wind power prediction models  
[NASA-CR-149235]  
13 p0105 N77-12509
- MCGLENERY, G. G.  
SO2 control technologies - Commercial availabilities and economics  
14 p0191 A77-27279
- MCGOWAN, J. G.  
Design and operational evaluation of a 25 kW wind turbine generator for residential heating applications  
16 p0468 A77-48901
- MCHARG, B.  
Design considerations for a noncircular Tokamak demonstration plant  
[GA-A-14074]  
15 p0351 N77-22968
- MCHENRY, H. I.  
Ship steel weldments for low temperature service  
[PB-256997/8]  
13 p0103 N77-12203
- MCLVAINE, R. W.  
State of the art of particulate and SO2 removal on coal fired boilers  
15 p0293 A77-35167

- MCINTOSH, G. E.  
Cryogenic design for large superconductive energy storage magnets  
16 p0411 A77-42156
- MCINTOSH, R.  
Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512  
Development of a low temperature phase change material package  
[AIAA PAPER 77-762] 15 p0325 A77-39514  
The International Heat Pipe Experiment  
13 p0120 N77-14389
- MCKAY, R. A.  
The helical screw expander evaluation project  
16 p0456 A77-48809
- MCKEE, H. B.  
A precise satellite thermal control system using cascaded heat pipes  
[AIAA PAPER 77-777] 15 p0312 A77-37282
- MCKENNA, R. P.  
KIPS - Kilowatt Isotope Power System  
13 p0041 A77-12837
- MCKENNEY, D. B.  
A modular fixed-mirror Brayton-cycle solar power system  
14 p0154 A77-21846
- MCKENZIE, A. W.  
A central receiver solar system applicable to central power stations  
16 p0483 A77-49036
- MCKEOWN, C. J.  
Operation of military field heating equipment using solid fuels  
[AD-A037121] 15 p0388 N77-27152
- MCKENNA, G. G.  
Space construction base operations in support of solar power satellite development  
16 p0468 A77-48907
- MCKIE, W. B.  
Fermi function model absorption profile for solar-thermal conversion  
16 p0483 A77-49035
- MCKINNON, B. A.  
Projected thermodynamic efficiencies of fusion power plants  
[BNWL-2017] 16 p0550 N77-32958
- MCKITTRICK, S.  
Cost analysis of two air quality attainment strategies  
[PB-254182/9] 13 p0092 N77-10719
- MCKLVEEN, J. W.  
Energy in Perspective: An orientation conference for educators  
[CONF-760677] 15 p0373 N77-25648
- MCKOWN, G. L.  
Prerequisites for military/civilian geopressured geothermal resource development  
13 p0031 A77-12761
- MCKOY, G. C.  
Penetration analysis and margin requirements associated with large-scale utilization of solar power plants  
[PB-257546/2] 14 p0208 N77-16459
- MCLAUGHLIN, B. R.  
Experimental results for a heat pump system with thermal storage  
[COO-2704-3] 14 p0250 N77-21697
- MCHORDIE, B.  
Solar heating and cooling computer analysis - A simplified sizing design method for non-thermal specialists  
16 p0497 A77-49157
- MCHULLAN, J. T.  
On the energy pattern factor in wind measurements  
15 p0322 A77-38788  
On the optimum orientation of solar collectors  
15 p0322 A77-38789
- MCHURRIN, J. C.  
Performance measurements of a cylindrical glass honeycomb solar collector compared with predictions  
[ASME PAPER 76-WA/SOL-3] 14 p0188 A77-26508
- MCHURTRY, G. J.  
Interpretation of Pennsylvania agricultural land use from ERTS-1 data  
[E77-10111] 14 p0215 N77-18525
- MCHALLY, J. R., JR.  
Advanced fuels for inertial confinement  
13 p0061 A77-17016
- MCPHERDAN, B. C.  
On the theory and solar application of inductive grids  
16 p0419 A77-43556
- MCPHERSON, W. B.  
Potential structural material problems in a hydrogen energy system  
15 p0281 A77-33389
- MCHAE, W. V.  
Design and analysis of a 5000-MW GaAs satellite power system  
16 p0464 A77-48871
- MCSADDEN, W. E.  
The use of geothermal energy at military installations  
[AD-A034241] 15 p0366 N77-24626
- MCSWENNY, T. B.  
Simulation and cost optimization of solar heating of buildings in adverse solar regions  
14 p0180 A77-25897
- MCVAY, D. R.  
Improvement in phosphoric acid cell powerplant technology  
[AIAA 77-1011] 16 p0403 A77-41558
- MCVEIGH, J. C.  
Developments in solar energy utilisation in the United Kingdom  
13 p0018 A77-12402  
Sun power: An introduction to the applications of solar energy  
15 p0288 A77-33967  
The 'wind-wall' - An integrated wind/solar system  
16 p0410 A77-42075
- MEAD, W.  
Draft environmental assessment of application by ERDA for a special land use permit for use of public lands in Wyoming for in situ coal gasification experiments  
[UCID-17011] 13 p0100 N77-11572
- MEADER, D. E.  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser  
15 p0326 A77-39532
- MEADER, E. D.  
A unique Rankine-cycle heat pump system  
13 p0036 A77-12799
- MEADOR, J. T.  
NIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems  
[ORNL-HUD-NIUS-6] 14 p0249 N77-21684
- MEADY, P. L.  
Sandia Laboratories energy programs  
[SAND-77-0034] 16 p0555 N77-33629
- MEAKIN, J. D.  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications  
16 p0486 A77-49059
- MEBUSS, H. G.  
A methodical approach concerning energy supply problems  
13 p0016 A77-12062
- MEDIN, S. A.  
Investigation of two-dimensional electric effects in a sectional MHD-channel  
15 p0317 A77-37930  
Effect of two-dimensional inhomogeneities on the properties of framed MHD channels  
16 p0428 A77-46088
- MEHALICK, E. E.  
Two component thermal energy storage material  
[PB-252592/1] 13 p0090 N77-10675
- MEI, J. S.  
Heat pipes for fluid-bed gasification of coal  
Metallurgical condition of heat pipes after tests in process environment  
13 p0031 A77-12764  
Fluidized-bed combustion of anthracite refuse  
16 p0454 A77-48793
- BRIDAV, T.  
Thermal efficiency of geothermal power  
14 p0205 A77-29788  
An update of world geothermal energy development  
15 p0286 A77-33524



- MEIER, D. L.  
Studies of biofouling in ocean thermal energy conversion plants  
16 p0484 A77-49044
- MEIER, F.-W.  
Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility  
15 p0271 A77-32800
- MEIER, R.  
On the application of radionuclide techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells  
16 p0425 A77-45151
- MEIER, R. U.  
Investigation of acid-resistant electrocatalysts for fuel cells  
[NASA-TT-F-17367]  
14 p0207 N77-16444
- MEIER, P. H.  
Solid waste as an energy source for the northeast [BNL-50559]  
15 p0352 N77-23012
- MEIJER, R. J.  
Design considerations on a thermal energy storage Stirling engine automobile  
[SAE PAPER 770080]  
16 p0424 A77-44558
- MEINEL, A. B.  
Progress in development and application of selective surfaces  
13 p0072 A77-19052
- Solar photothermal power generation  
14 p0146 A77-21700
- A modular fixed-mirror Brayton-cycle solar power system  
14 p0154 A77-21846
- Applied solar energy: An introduction /2nd edition/  
15 p0286 A77-33445
- MEINEL, M. P.  
Solar photothermal power generation  
14 p0146 A77-21700
- A modular fixed-mirror Brayton-cycle solar power system  
14 p0154 A77-21846
- Applied solar energy: An introduction /2nd edition/  
15 p0286 A77-33445
- MEITLIS, V. P.  
Influence of flow nonuniformity on plasma instability at the channel wall  
15 p0269 A77-32520
- MELAND, L.  
Survey of selective absorber coatings for solar energy technology  
14 p0199 A77-29067
- MELENTEV, L. A.  
Principles of atomic central heating  
14 p0136 A77-20102
- The principles of system studies in nuclear energy research  
14 p0157 A77-22342
- Role of the nuclear energy system in the total fuel-energy picture in the USSR  
15 p0267 A77-32220
- MELFI, S. H.  
Tracking pollutants from a distance  
13 p0067 A77-18370
- MELISS, M.  
The future importance of solar energy for the supply of the German Federal Republic with energy  
13 p0070 A77-18597
- Regenerative energy sources  
15 p0263 A77-31577
- Energy sources for tomorrow  
[ERDA-TE-226]  
15 p0391 N77-27507
- MELNIKOVA, M. V.  
Some questions concerning the creation of a solar thermionic converter system  
15 p0315 A77-37765
- Some problems involved in the development of a solar thermionic power plant  
16 p0436 A77-47421
- MELSENBERG, S. S.  
An immiscible fluid - Heat of fusion energy storage system  
16 p0493 A77-49113
- MELTON, W. C.  
Insulation and temperature statistics and their influence on the design of solar heating systems and the electric utility interface  
16 p0479 A77-49000
- MENARD, W. A.  
New potentials for conventional aircraft when powered by hydrogen-enriched gasoline  
15 p0281 A77-33392
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline  
14 p0243 N77-21629
- MENASIAN, S.  
The sigma high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794
- MENASIAN, S. C.  
Advanced fuel fusion experimentation with Mignacells II and III - Orbit diagnostics and lifetime measurements  
16 p0436 A77-47362
- Fusion products detection system in Mignacell II  
16 p0436 A77-47363
- MENDELSON, H.  
HYCOS - A solar heating, cooling and energy conversion system based on metal hydrides  
13 p0029 A77-12740
- MENDERSHAUSEN, H.  
Europe's changing energy relations  
[R-2086-ISA]  
16 p0553 N77-33610
- MENHGER, L.  
A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs  
13 p0014 A77-11591
- MENEZES, C.  
Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters  
15 p0320 A77-38330
- MENEZES, S.  
Stable semiconductor liquid junction cell with 9 percent solar-to-electrical conversion efficiency  
15 p0290 A77-34429
- Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells  
15 p0320 A77-38367
- MENGA, P.  
On-the-road evaluation of the efficiency of propulsion system of city vans  
14 p0160 A77-22888
- MENSPORTH, T.  
Wind-power generation on a large scale - A design idea  
13 p0050 A77-14531
- MENSINGER, M.  
Initial environmental test plan for source assessment of coal gasification  
[PB-261916/1]  
15 p0350 N77-22705
- MENTZER, M.  
Chemical characterization of diesel exhaust particulates  
[PBEC/EI-77/5]  
16 p0540 N77-31671
- MENZER, M. S.  
Gas-fired heat pumps - An emerging technology  
14 p0195 A77-27891
- MERCHER, L. H.  
Small space station electrical power system design concepts  
13 p0040 A77-12835
- MERCK, W. F. H.  
Boundary-layer separation from the electrode wall of an HHD generator  
13 p0048 A77-13711
- MERRIAN, M. P.  
Solar industrial steam  
16 p0482 A77-49029
- MERKLE, T.  
Basic requirements for the various items of equipment for supplying energy to electrically driven road vehicles from the point of view of the user  
14 p0160 A77-22890
- MERRIAN, M. P.  
Wind energy for human needs  
14 p0145 A77-21400
- Solar industrial steam  
[UCRL-77895]  
14 p0231 N77-20592
- MERRIFIELD, D. V.  
Energy-efficient desiccant drying/dehumidification using solar or fossil fuel energy  
16 p0449 A77-48750

- MERRILL, D.  
ERDA Interlaboratory Work for Data Exchange (IWGDE)  
[LBL-5329] 15 p0352 N77-22998
- MERRILL, G. L.  
Study of small turbofan engines applicable to  
single-engine light airplanes  
[NASA-CR-137944] 13 p0093 N77-11054  
North View Junior High School solar energy  
demonstration project  
[PB-267447/1] 16 p0548 N77-32612
- MERRILL, O. S.  
Uranium zirconium hydride reactor space power  
systems  
[IAF PAPER 76-256] 13 p0004 A77-10953  
ERDA's Bicentennial Thermionic Research and  
Technology Program 13 p0042 A77-12861
- MERSIER, C.  
Interaction between the solar mirror field and the  
thermodynamic system of a turning solar power  
plant 14 p0151 A77-21824
- MERZ, J. L.  
GaAs double-heterostructure photodetectors  
16 p0426 A77-45304
- MESEROLE, J. S., JR.  
Reciprocating pump for conversion of liquid  
hydrogen to high pressure gaseous hydrogen  
15 p0284 A77-33409  
Reciprocating pump for conversion of liquid  
hydrogen to high pressure gaseous hydrogen  
14 p0245 N77-21647
- MESSINA, J.  
Investigation of the causes of stuck servovalves  
in U.S. Army hydraulic systems using MIL-H-46170  
'Hydraulic Fluid, Rust Inhibited, Fire  
Resistant, Synthetic Hydrocarbon Base'  
[ASLE PREPRINT 77-AH-2A-1] 15 p0296 A77-35956
- MESSINGER, H.  
Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361
- METCALFE, C. I.  
Fluidisation and gas combustion in a rotating  
fluidised bed 15 p0264 A77-31674
- METZ, W. D.  
Solar thermal electricity - Power tower dominates  
research 16 p0400 A77-40647  
Wind energy - Large and small systems competing  
16 p0441 A77-48267
- MEULENBURG, A., JR.  
A novel cover slide for solar cells 14 p0148 A77-21789  
The sawtooth coverslide - A new means of coupling  
light into solar cells 15 p0298 A77-36263
- MEULI, R.  
Solar energy installation for the project 'Motto  
di Lena' in Minusio/Tessin 16 p0441 A77-48257
- MEYER, C. F.  
Role of the heat storage well future U.S. energy  
systems  
[PB-263480/6] 15 p0367 N77-24634
- MEYER, H.  
Synchronous inversion - Concept and application  
16 p0490 A77-49088
- MEYER, T. J.  
Fuel cells and solid electrolytes  
[AD-A033782] 15 p0366 N77-24630
- MEYER, W.  
Flue gas desulfurization experience 14 p0136 A77-20381
- MEYER, W. C.  
Solution of silica in Green River oil shale  
14 p0169 A77-23558
- MEYERS, R. A.  
Low-sulfur coal obtained by chemical  
desulfurization followed by liquefaction  
13 p0008 A77-11242  
Applicability of the Meyers Process for  
desulfurization of U.S. coal /A survey of 35  
coal mines/ 14 p0191 A77-27278
- MEYLAN, J. L.  
Effect of the characteristics of electrical supply  
networks on the design of solar power plants  
14 p0155 A77-21858
- MEZEY, E. J.  
Fuel contaminants. Volume 1: Chemistry  
[PB-256020/9] 13 p0103 N77-12231
- MIAO, D.  
Initial operation of a solar heating and cooling  
system in a full-scale solar building test  
facility 16 p0498 A77-49164
- MICHAEL, H.  
Preliminary analysis of electric generation  
utilizing geopressured geothermal fluids  
13 p0030 A77-12752
- MICHAEL, H. K.  
Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 4: Surface  
technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- MICHAELIS, T. D.  
Design definition of a mechanical capacitor  
[NASA-CR-152613] 16 p0552 N77-33603
- MICHAELS, H. J.  
Fuel gas production via Koppers-Totzek  
gasification - An economic analysis  
15 p0301 A77-36336
- MICHAELS, L. H.  
Hybrid simulation of fuel cell power conversion  
systems 16 p0414 A77-42636
- MICHAL, C.  
A non-technical evaluation of four different  
concrete wall solar collector configurations  
16 p0478 A77-48990
- MICHEL, J.  
Periodically adjustable concentrators adapted to  
solar cell panels 13 p0074 A77-19068  
High-efficiency thin silicon solar cells  
14 p0148 A77-21786  
Periodically adjustable concentrators adapted to  
solar cell panels 14 p0166 A77-23385
- MIGLIORE, P. G.  
Numerical solution for the unsteady lifting  
characteristics of variable pitch cross-flow  
wind turbines 13 p0044 A77-12871
- MIKOLOWSKY, W. T.  
The military utility of very large airplanes and  
alternative fuels 16 p0434 A77-47271  
The potential of liquid hydrogen as a military  
aircraft fuel  
[AD-A026666] 13 p0118 N77-14272  
The potential role of technological modifications  
and alternative fuels in alleviating Air Force  
energy problems  
[AD-A039597] 16 p0525 N77-30261  
An evaluation of very large airplanes and  
alternative fuels  
[AD-A040532] 16 p0532 N77-31334  
An evaluation of very large airplanes and  
alternative fuels: Executive summary  
[AD-A042112] 16 p0550 N77-33154
- MILANESI, M. M.  
A possible correlation of the neutron yield to the  
electromechanic work in Hather-type plasma focus  
devices 13 p0061 A77-17017
- MILAU, J.  
The behavior of iron titanium hydride test beds -  
Long-term effects, heat transfer and modeling  
15 p0280 A77-33386  
Closed Brayton cycle using hydrogen as a work fluid  
[BNL-20899] 13 p0085 N77-10542  
The behavior of iron titanium hydride test beds:  
Long-term effects, heat transfer and modeling  
14 p0242 A77-21621
- MILEY, G. H.  
Studies of deuterium-fueled Tokamak reactors  
16 p0435 A77-47357
- MILEY, W.  
User needs vs. technical demands, or the art of  
tradeoff in making a good, inexpensive solar home  
16 p0495 A77-49134
- MILFORD, W. E., JR.  
Cassava fuel alcohol in Brazil 16 p0444 A77-48707

- MILGRAM, J.  
Being prepared for future Argo Merchants  
16 p0425 A77-45228
- MILHAM, M. E.  
Infrared extinction spectra of some common liquid aerosols  
15 p0290 A77-34561
- MILLER, A. J.  
MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems  
[ORNL-HUD-MIUS-6] 14 p0249 A77-21684  
Annual cycle energy system: Initial investigations  
[ORNL-TM-5525] 15 p0364 A77-24599
- MILLER, B.  
Spectral response and efficiency relations in semiconductor liquid junction solar cells  
15 p0264 A77-31823  
Stable semiconductor liquid junction cell with 9 percent solar-to-electrical conversion efficiency  
15 p0290 A77-34429  
Solar conversion efficiency of pressure sintered cadmium selenide liquid junction cells  
15 p0320 A77-38367
- MILLER, B. P.  
SEASAT - A candidate ocean industry economic verification experiments  
[NASA-CR-149228] 13 p0104 A77-12476
- MILLER, C.  
A simple approach to metal hydride alloy optimization  
14 p0243 A77-21624
- MILLER, C. D.  
Geochemistry and hydrothermal alteration at selected Utah hot springs, volume 3  
[PB-264415/1] 15 p0378 A77-26606
- MILLER, C. F.  
Hawaii technology utilization experiment  
[UCID-17343] 15 p0398 A77-28038
- MILLER, C. G.  
A simple approach to metal hydride alloy optimization  
15 p0281 A77-33388  
Solar energy collection system  
[NASA-CASE-NPO-13579-2] 14 p0229 A77-20565  
Low cost solar energy collection system  
[NASA-CASE-NPO-13579-3] 14 p0229 A77-20566  
Solar pond  
[NASA-CASE-NPO-13581-2] 16 p0513 A77-28584  
Low to high temperature energy conversion system  
[NASA-CASE-NPO-13510-1] 16 p0545 A77-32581  
Three-dimensional tracking solar energy concentrator and method for making same  
[NASA-CASE-NPO-13736-1] 16 p0545 A77-32583
- MILLER, D. R.  
Performance correlations of five solar collectors tested simultaneously outdoors  
16 p0498 A77-49162  
Outdoor performance results for NBS Round Robin collector no. 1  
[NASA-TM-X-73547] 13 p0106 A77-12520  
Performance correlations of five solar collectors tested simultaneously outdoors  
[NASA-TM-X-73546] 13 p0128 A77-15487  
Summer performance results obtained from simultaneously testing ten solar collectors outdoors  
[NASA-TM-X-73594] 14 p0229 A77-20563  
Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator  
[NASA-TM-73718] 16 p0529 A77-30611
- MILLER, G. K.  
Commuter van programs - An assessment  
14 p0137 A77-20391
- MILLER, I. J.  
Energy from wastes  
15 p0272 A77-33280  
Decision making in the utilisation of the organic fraction of municipal wastes  
15 p0299 A77-36272
- MILLER, J.  
The BBC Solarwatt system  
15 p0337 A77-39989
- MILLER, J. D.  
Recovery of bitumen from oil-impregnated sandstone deposits of Utah  
14 p0194 A77-27349
- MILLER, J. L.  
Space power technology applied to the energy problem  
16 p0526 A77-30294
- MILLER, J. S.  
Fracturing oil shale with explosives for in situ recovery  
14 p0169 A77-23559
- MILLER, L. G.  
Making electricity from moderate temperature fluids  
13 p0002 A77-10649  
Preliminary failure modes, effects and Criticality Analysis (PHECA) of the Brayton Isotope Power System (BIPS) ground demonstration system  
[TID-27301] 15 p0392 A77-27526
- MILLER, M.  
Detailed geographic analysis of residential energy consumption  
13 p0043 A77-12864  
Comparative evaluation of solar heating alternatives  
[COO-2703-2] 13 p0129 A77-15498
- MILLER, M. L.  
Flywheel-electric hybrid vehicle  
14 p0159 A77-22886
- MILLER, R. A.  
The magma high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794  
Design considerations for a magma advanced fuel fusion reactor  
15 p0334 A77-39747  
Generalized criterion for controlled fusion  
16 p0436 A77-47368
- MILLER, R. D.  
Hydrogenation of lignite with synthesis gas  
14 p0201 A77-29525
- MILLER, R. E.  
Wind energy conversion  
[PB-256198/3] 13 p0115 A77-13552  
Wind energy conversion  
[PB-268718/4] 16 p0559 A77-33667
- MILLER, R. S.  
Gallium arsenide concentrator system  
[AIAA PAPER 77-487] 14 p0172 A77-23907
- MILLER, W. E.  
The design and development of a 30 kW-hr lithium-aluminum/iron sulfide electric vehicle battery  
16 p0446 A77-48726
- MILLER, W. B.  
Large scale scientific computation via minicomputer  
[PB-267575/9] 16 p0541 A77-31823
- MILLS, A. F.  
Analysis of coal particles undergoing rapid pyrolysis  
14 p0175 A77-24212
- MILLS, F.  
Plasma heating systems planned for the Argonne experimental power reactor  
16 p0407 A77-41712
- MILLS, G.  
Demand electric rates - A new problem and challenge for solar heating  
14 p0137 A77-20388
- MILLS, R. G.  
Optimization of fusion-driven fissioning systems  
[PPPL-1285] 15 p0342 A77-22469
- MILNER, F.  
A summary of the DARPA energy and materials shortages programs, fiscal years 1972-1976  
[AD-A036021] 15 p0375 A77-25677
- MILNES, A. G.  
Efficiency calculations for Al<sub>x</sub>Ga<sub>1-x</sub>As-GaAs heteroface solar cells  
15 p0257 A77-30720
- MILORA, S. L.  
Geothermal energy as a source of electric power: Thermodynamic and economic design criteria  
13 p0060 A77-16623  
Geothermal energy for electrical and nonelectrical applications  
[LA-UR-76-418] 13 p0123 A77-14601
- MILOVANOVIĆ, A. F.  
Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters  
16 p0402 A77-41360

- MILTZER, E.**  
An analysis of the technology role in US power during the mid-range period  
[AD-A024042] 13 p0102 N77-11927
- MINA, J. A.**  
Dilute-phase hydrogasification process for SHG production  
14 p0191 A77-27277
- MINEE, D. K.**  
Comparison of an electric versus a gasoline powered utility truck in two years of a service test program  
14 p0160 A77-22891
- MINGALBEV, F. M.**  
Testing the annular combustor of the NK-8 aero-engine on natural gas  
16 p0426 A77-45325
- MINKOFF, M.**  
An optimization approach to the design of the preheater for a magnetohydrodynamic powerplant  
15 p0318 A77-38207
- MINKOFF, M.**  
Overview of MINPACK  
[CONF-760842-19] 15 p0396 N77-27761
- MINKOV, V. A.**  
New requirements for the development and design of thermal power systems  
14 p0167 A77-23407
- MINKOVICH, B. M.**  
Gas release during long-term operation of heat pipes  
13 p0050 A77-14328
- MINSUCCI, J. A.**  
Silicon solar cells by high-speed low-temperature processing  
15 p0258 A77-30728
- MINTZ, M.**  
Design considerations for a noncircular Tokamak demonstration plant  
[GA-A-14074] 15 p0351 N77-22968
- MINTZ, M. S.**  
Design of the Montana Magnetohydrodynamics Component Development and Integration Facility  
16 p0458 A77-48822
- MIRAGLIA, F. J., JR.**  
Environmental survey of the reprocessing and waste management portions of the LWR fuel cycle: A task force report  
[PB-258316/9] 14 p0209 N77-16879
- MIRANDA, G. A.**  
Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet  
14 p0144 A77-21391
- MIRANDA, G. A.**  
Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet  
[LA-UR-76-1809] 14 p0235 N77-21325
- MIRANDY, L. P.**  
Rotor/generator isolation for wind turbines  
[AIAA 77-372] 14 p0180 A77-25782
- MIRONOV, S. V.**  
Review of the state of the art with Tokamaks in USSR  
[EUR-CEA-PC-839-TR] 16 p0541 N77-31981
- MIRONOV, V. D.**  
Measurement of the excess oxidant ratio in the combustion products of an MHD-generator  
14 p0136 A77-20107
- MIROSHCHENKO, A. A.**  
Increasing the electrical strength of the interelectrode gap in an MHD generator  
16 p0428 A77-46091
- MIRZAGATOV, SB. A.**  
Photoelectric and electrical properties of n-SiC - n-CdS heterojunctions  
16 p0442 A77-48518
- MIRZA, R. B.**  
Computation of solar radiation design curves  
13 p0072 A77-19049
- MISHER, D. K.**  
Fiat petrol engine performance with a mixture of basil extract with petrol  
14 p0179 A77-25196
- MISKOLCEY, G.**  
Thermionic topping of a steam power plant  
13 p0034 A77-12789
- MISKOLCEY, G.**  
Evaluation of MHD-thermionic-steam cycles  
16 p0467 A77-48895
- MISURIELLO, R. P.**  
Minimum Energy Building - The first winter's operation  
16 p0496 A77-49144
- MITCHAN, A. J.**  
Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator  
14 p0144 A77-21386
- MITCHELL, A. S.**  
Compressed air energy storage for electric utility load leveling  
16 p0458 A77-48825
- MITCHELL, J. W.**  
The Wisconsin Regional Energy project - An applied systems analysis approach to regional energy/environment modeling  
15 p0309 A77-36825
- MITCHELL, J. W.**  
Simulation study of solar heat pump systems  
16 p0477 A77-48982
- MITCHELL, K. W.**  
Photovoltaic energy conversion with n-CdS-p-CdTe heterojunctions and other II-VI junctions  
15 p0259 A77-30741
- MITCHELL, K. W.**  
Analysis of the fill factor for n-CdS/p-CdTe solar cells  
16 p0402 A77-41433
- MITCHELL, K. W.**  
Silicon solar cell testing in concentrated sunlight and simulated sunlight  
16 p0527 N77-30540
- MITCHELL, K. W.**  
Evaluation of the CdS/CdTe heterojunction solar cell  
16 p0545 N77-32584
- MITCHELL, P. D.**  
Conceptual heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility at Sandia, Albuquerque  
15 p0318 A77-38209
- MITCHELL, P. D.**  
Modeling aspects of a gas turbine solar-electric power system  
15 p0318 A77-38210
- MITCHELL, P. D.**  
Conceptual design of an open cycle gas turbine solar central receiver system  
16 p0481 A77-49022
- MITCHELL, P. D.**  
Heliostat field design for the ERDA 5 Megawatt Solar Thermal Test Facility  
16 p0484 A77-49040
- MITCHELL, R. C.**  
Gravel and liquid storage system for solar thermal power plants  
16 p0491 A77-49101
- MITCHELL, W. C.**  
Transport theory of 3M high-performance thermoelectric materials  
13 p0042 A77-12848
- MITCHNER, J. L.**  
Land use, energy flow and policy making in society. SIMPAC handbook. A guide to the modeling of socio-economic phenomena  
[PB-267134/5] 16 p0530 N77-30637
- MITCHNER, M.**  
An experimental investigation of fluctuating properties within a combustion MHD generator  
15 p0330 A77-39559
- MITKOWSKI, E.**  
Curve of current delivered from MHD generator to a conventional power grid by inverter system  
14 p0141 A77-21253
- MITOFF, S. P.**  
Recent progress in development of sodium-sulfur battery for utility application  
16 p0448 A77-48740
- MITSUI, A.**  
Bioconversion of solar energy in salt water photosynthetic hydrogen production systems  
15 p0278 A77-33369
- MITSUI, A.**  
Bioconversion of solar energy in salt water: Photosynthetic hydrogen production systems  
14 p0239 N77-21603
- MITAL, M. L.**  
Electric power fluctuations in a MHD generator  
15 p0269 A77-32432
- MIXON, W. B.**  
Energy conservation potential of Modular Integrator Utility Systems /MIUS/  
13 p0026 A77-12724
- MIXON, W. B.**  
Annual cycle energy system: Initial investigations  
[ORNL-TR-5525] 15 p0364 N77-24599
- MIYAHARA, T. F.**  
Electrical 2-omega-cm 0.046-cm-thick silicon solar cells as a function of intensity and temperature  
[NASA-CR-155166] 16 p0553 N77-33604
- MITYAKH, Y.**  
Rechargeable batteries in Japan  
16 p0431 A77-46783

- MIYAHOTO, K.  
Possibility of medium energy neutral beam  
injection into stellarator reactor  
14 p0184 A77-26093
- MIYATA, H.  
Non-equilibrium MHD power generation using  
non-seeded argon plasma  
13 p0004 A77-11022
- MIZRAB, T.  
Operation of ITO/Si heterojunction solar cells  
13 p0014 A77-11762  
Indium-tin-oxide-silicon heterojunction  
photovoltaic devices  
15 p0259 A77-30735
- MIZUTA, S.  
The calcium-iodine cycle for the thermochemical  
decomposition of water  
15 p0275 A77-33340
- MLAVSKY, A. I.  
The silicon ribbon solar cell  
13 p0076 A77-19083  
EPG growth of silicon ribbon for solar cells  
16 p0485 A77-49051
- MOCK, P.  
Transmitter experiment package for the  
communications technology satellite  
[NASA-CR-135035]  
15 p0360 A77-24332
- MOELLER, G. L.  
Design guidelines for energy conserving systems  
[PB-268989/1]  
16 p0559 A77-33670
- MOEN, R. L.  
Hydrogen and oxygen from water  
16 p0430 A77-46573
- MOGFORD, J. A.  
Magma energy research project, volume 2, no. 2  
[SAND-76-0264-VOL-2-NO-2]  
15 p0372 A77-25638
- MOKREYSZCZAK, M.  
Influence of atmospheric conditions on the  
parameters of a turbojet engine  
15 p0323 A77-39270
- MOLL, K. D.  
Research to anticipate environmental impacts of  
changing resource usage  
[PB-256293/2]  
13 p0101 A77-11602
- MOLLENKOFF, H. C.  
Silicon solar cells on zone-melted  
silicon/graphite substrates  
16 p0426 A77-45303
- MOLLY, J. P.  
Possibilities for utilizing wind energy  
13 p0056 A77-15853  
Balancing power supply from wind energy converting  
systems  
14 p0166 A77-23361
- MOLZ, F. J.  
Experimental study of the subsurface transport of  
water and heat as related to the storage of  
solar energy  
16 p0493 A77-49112
- MONBETHY, A. H.  
Fuel subsystem characteristics for LH2 aircraft  
15 p0281 A77-33393  
Fuel subsystem characteristics for LH2 aircraft  
14 p0243 A77-21630
- MONASSEN, J.  
Photoelectrochemical energy conversion and storage  
- The polycrystalline CdSe cell with different  
storage modes  
14 p0196 A77-28463
- MONFORD, L. G.  
Performance characteristics of a diesel engine  
using low- and medium-energy gases as a fuel  
supplement (fumigation)  
[NASA-TN-X-58188]  
13 p0126 A77-14955
- MONGITORE, D. A.  
Solar energy applications and related legislation  
[PB-267901/7]  
16 p0539 A77-31666
- MONTAGNA, J.  
Reducing the environmental impact of solid wastes  
from a fluidized-bed combustor  
16 p0454 A77-48790
- MONTGOMERY, D. B.  
The technology base for large MHD superconducting  
magnets  
14 p0140 A77-21233  
Superconducting magnet development for the MHD  
program  
15 p0331 A77-39569
- MONTGOMERY, D. S.  
Sulfur compounds in oils from the Western Canada  
Tar Belt  
14 p0169 A77-23553
- MONZINGO, R.  
Preliminary design study of a baseline MIUS  
[NASA-TN-X-58193]  
16 p0561 A77-34050
- MOODY, D. R.  
The solid-fuel gas turbine for industrial energy  
production  
16 p0453 A77-48785
- MOON, R. L.  
GaAs solar cells for very high concentrations  
14 p0204 A77-29581
- MOORE, A. R.  
Design considerations for high-intensity solar cells  
14 p0179 A77-25591
- MOORE, B. J.  
Helium resources of the United States, 1973  
[PB-252473/4]  
13 p0085 A77-10623  
Analysis of natural gases, 1975  
[PB-259351/5]  
14 p0228 A77-20197
- MOORE, C. S.  
Analytical and experimental treatment of a  
spray-on selective coating - Application to  
collector design  
16 p0487 A77-49064
- MOORE, D. C.  
Solar residential demonstration program  
16 p0469 A77-48914
- MOORE, D. F.  
Remote sensing of an underground coal-burn cavity  
with a wide-band induction system  
13 p0007 A77-11050
- MOORE, S. W.  
Practical aspects of solar heating - A review of  
materials use in solar heating applications  
13 p0049 A77-13743
- MORAIN, S.  
Analysis of LANDSAT B imagery as a tool for  
evaluating, developing, and managing the natural  
resources of New Mexico  
[E77-10090]  
14 p0214 A77-18511
- MORAN, J.  
Tracking pollutants from a distance  
13 p0067 A77-18370
- MORAN, S. R.  
An engineering, geological and hydrological  
environmental assessment of a 250 MMSCFD dry ash  
Lurgi coal gasification facility  
16 p0418 A77-43143
- MORASH, R. T.  
Exact 60 cycle power generation at any speed  
16 p0450 A77-48759
- MORAV, G.  
Energy investment in nuclear and solar power plants  
15 p0257 A77-30599
- MOREBELLO, M.  
OPTIMO - A method for process evaluation applied  
to the thermochemical decomposition of water  
15 p0340 A77-38526
- MOREHOUSE, J. H.  
Diversification as an energy conservation strategy  
13 p0027 A77-12725  
Two investigations of flat-plate solar collector  
performance  
15 p0355 A77-23598
- MORELLI, P.  
Catalytic action of combustion-product deposits in  
the oxidation of SO2 to SO3 within the  
combustion chambers and exhaust channels of  
thermoelectric plants  
16 p0420 A77-44179
- MORETTI, A.  
Plasma heating systems planned for the Argonne  
experimental power reactor  
16 p0407 A77-41712
- MORGAN, D. T.  
Combined diesel-organic Rankine-cycle power plant  
16 p0459 A77-48830
- MORGAN, G.  
Studies of helical conductor models for  
superconducting ac power transmission  
[BNL-21784]  
14 p0236 A77-21332
- MORGAN, G. B.  
Gravel and liquid storage system for solar thermal  
power plants  
16 p0491 A77-49101

- MORGAN, J. P.  
Space power technology applied to the energy problem  
16 p0526 N77-30294
- MORGAN, B.  
On the energy pattern factor in wind measurements  
15 p0322 A77-38788  
On the optimum orientation of solar collectors  
15 p0322 A77-38789
- MORGENSTHAU, G. W.  
Space shuttle missions of the 80's; Proceedings of  
the Twenty-first Annual Meeting, Denver, Colo.,  
August 26-28, 1975. Parts 1 & 2  
15 p0304 A77-36526
- MORI, Y.  
Fundamental research on heat transfer performances  
of solar focusing and tracking collector  
16 p0502 A77-50223
- MORIMURA, P. T.  
An analysis on optimal design of solar heating and  
cooling system for school  
16 p0477 A77-48984
- MORIN, O. J.  
Geology and potential uses of the geopressure  
resources of the Gulf Coast  
[UCID-17163]  
14 p0215 N77-18562
- MORINO, L.  
Potential aerodynamic analysis of horizontal-axis  
windmills  
[AIAA PAPER 77-132]  
14 p0135 A77-19848  
Two general methods for the unsteady aerodynamic  
analysis of horizontal-axis windmills  
16 p0467 A77-48896
- MORONI, B. C.  
Hydrogenation of lignite with synthesis gas  
14 p0201 A77-29525
- MOROZ, A. I.  
Investigation of the thermophysical  
characteristics of low-temperature heat pipes  
with metal-fiber wicks  
13 p0050 A77-14321  
Structural heat conductivity of fiber metal wicks  
for heat pipes  
13 p0050 A77-14326
- MOROZOV, G. N.  
Comparative evaluation of technical and economic  
indices for MHD and thermionic toppers for steam  
turbine facilities  
16 p0469 A77-48909
- MOROZOV, V. K.  
Anomalous current-voltage characteristics observed  
during reactor tests of multielement thermionic  
assemblies  
13 p0018 A77-12361
- MORRESI, A. C.  
Energy from solid wastes  
13 p0003 A77-10698  
Energy from wood wastes  
15 p0273 A77-33301
- MORRIS, C.  
Opportunities for battery powered road vehicles  
14 p0160 A77-22892
- MORRIS, D. W.  
Possible effects of nuclear initiative on supply  
and use of electricity in California  
[AD-A026582]  
13 p0131 N77-15510  
California's energy future  
[AD-A032221]  
15 p0348 N77-22667
- MORRIS, G. R.  
Bioconversion of agricultural wastes for pollution  
control and energy conservation  
[TID-27164]  
15 p0383 N77-26675
- MORRIS, J. P.  
NASA thermionic-conversion program  
13 p0043 A77-12863  
Thermionic energy conversion technology - Present  
and future  
[AIAA PAPER 77-500]  
14 p0173 A77-23918  
The NASA thermionic-conversion /TEC-ART/ program  
16 p0438 A77-47960  
NASA Thermionic-Conversion program  
16 p0466 A77-48886  
NASA thermionic-conversion program  
[NASA-TN-X-73644]  
16 p0535 N77-31612
- MORRIS, J. R.  
Preliminary study of the importance of  
hydrothermal reactions on the temperature  
history of a hot, dry rock geothermal reservoir  
[PB-262391/6]  
14 p0252 N77-21731
- MORRISON, A. D.  
Energy requirement for the production of silicon  
solar arrays  
[NASA-CR-153409]  
16 p0528 N77-30604
- MORRISON, C. A.  
Experimental evaluation of the University of  
Florida solar powered ammonia/water absorption  
air conditioning system  
13 p0039 A77-12823  
Continuous solar air conditioning with  
ammonia/water absorption cycle  
14 p0182 A77-26057  
A comparative study of the effectiveness of  
baseboard convectors versus forced air solar  
heating at the University of Florida Solar House  
14 p0182 A77-26058  
A self-contained solar powered tracking device  
[ASME PAPER 76-WA/HT-26]  
14 p0186 A77-26477  
Solar properties of materials and testing of solar  
systems  
15 p0294 A77-35318
- MORRISON, D. J.  
Performance of a solar heating system utilizing  
phase-change energy storage  
16 p0480 A77-49004  
Performance of a solar heating system utilizing  
phase-change energy storage  
[CONR-760842-11]  
15 p0393 N77-27540
- MORRISON, F.  
Use of electrical methods for the delineation of  
geothermal reservoirs  
[PB-261507/8]  
15 p0351 N77-22750
- MORROW, R. B.  
Demonstration of a Free-Piston Stirling Linear  
Alternator power conversion system  
16 p0465 A77-48880
- MORSE, F. B.  
The current technology for solar heating and cooling  
16 p0470 A77-48919  
CCMS solar energy pilot study solar heating and  
cooling systems in buildings  
[UHD-4908-5]  
13 p0088 N77-10657  
Optimization studies of solar absorption air  
conditioning systems  
[NSF/RANN/SE/GI-39117/PR-76/2]  
14 p0250 N77-21690
- MORSE, R. W.  
Solar energy for the Australian food processing  
industry  
14 p0181 A77-25900  
Solar energy in Australia  
16 p0426 A77-45499
- MORTENSEN, J. J.  
LASL hot dry rock geothermal project  
[LA-6525-PR]  
15 p0372 N77-25639
- MOSCHETTI, B.  
Development of space applications of heat pipes at  
Aerospaziale  
13 p0120 N77-14390
- MOSHBACH, B.  
Predicted and measured finite-width effects in  
linear induction machines  
16 p0413 A77-42628  
Finite length effects in linear induction machines  
with different iron contours  
16 p0413 A77-42629
- MOSHER, D. N.  
The advantages of sun tracking for planar silicon  
solar cells  
14 p0181 A77-25904
- MOSIN, I. I.  
Heat-pipe regenerator for gas turbine engine  
13 p0020 A77-12528
- MOSKALOV, A. N.  
Energy output and service life characteristics of  
high-voltage low-temperature thermopiles  
16 p0442 A77-48517
- MOSKOWITZ, S.  
A pressurized fluidized bed coal fired combined  
cycle electric power generation  
[AIAA PAPER 77-1013]  
16 p0412 A77-42482  
Pressurized fluidized bed pilot plant for  
production of electric power using high sulfur  
coal  
16 p0453 A77-48782
- MOSKVICHEVA, V. N.  
Utilization of heat of geothermal springs and  
waste hot waters in freon-operated power plants  
14 p0175 A77-24207

- MOSHAN, N. J.  
Land use, energy flow and policy making in society. SIMPAC handbook. A guide to the modeling of socio-economic phenomena [PB-267134/5] 16 p0530 N77-30637
- MOSSBAUER, P. F.  
Kinetics of regeneration of spent seed from MHD power generation systems 14 p0141 A77-21251
- MOST, I. G.  
A ceramic heat exchanger for exhaust fired gas turbine power cycles 16 p0445 A77-48719
- NOTE, L. B.  
A method for evaluating SO<sub>2</sub> abatement strategies 15 p0293 A77-35169
- MOTICKA, P.  
The role of gas utilization in environmental protection 15 p0265 A77-31849
- MOUDY, L. A.  
High-efficiency GaAlAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741
- MOULTROP, P. B.  
Biosolar production of fuels from algae [UCRL-52177] 16 p0511 N77-28323
- MOUROUHI, A.  
The ONERSOL collector and its performance 14 p0150 A77-21809  
The thermodynamic cycle of the ONERSOL engine 14 p0152 A77-21829
- MOUNT, R. E.  
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 N77-26134
- MOURNIGHAN, B. E.  
Improved systems for energy conversion and conservation as pollution control alternatives - USEPA program 16 p0451 A77-48771
- MOYERS, J. C.  
Annual cycle energy system: Initial investigations [ORNL-TM-5525] 15 p0364 N77-24599
- MOYNIHAN, P. I.  
New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392  
New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 14 p0243 N77-21629
- MUEHLBERG, P. E.  
Environmental assessment of geopressured waters and their projected uses [PB-268289/6] 16 p0544 N77-32579
- MUEHLHAUSER, J. W.  
Slag layers in direct coal-fired MHD power generation 14 p0139 A77-21224  
Experimental investigation on a direct coal-fired MHD generator 14 p0141 A77-21238  
Experimental investigation of multiple-loaded diagonal conducting wall generators 15 p0325 A77-39529  
A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute 16 p0458 A77-48823
- MUELA, C. A.  
In-situ coal gasification: Status of technology and environment impact [PB-268576/6] 16 p0548 N77-32613
- MUELLER, H.  
The heat pump - An approach for saving energy 16 p0421 A77-44450
- MUELLER, R. E.  
Solar energy in Switzerland 13 p0080 A77-19127
- MUELLER, R. O.  
Solar energy and electric utilities - Should they be interfaced? 14 p0143 A77-21281  
Solar energy and electric utilities: Can they be interfaced? [ANL-ES-52] 16 p0515 N77-28601
- MUESEBERG, E. G.  
The pros and cons of variable geometry turbines 15 p0340 N77-22140
- MUFFLER, L. J. P.  
Present status of resources development 15 p0286 A77-33523
- MUHLENKAMP, S. P.  
Small scale tests on control methods for some liquefied natural gas hazards [AD-A033522] 15 p0341 N77-22293
- MUKHERJEE, N. K.  
Software aspects of super composites 13 p0053 A77-15301  
Investigation on the crystalline structure of Cu<sub>x</sub>/S-CdS solar cells 14 p0149 A77-21803  
Matching of solar cells and performance of a solar battery 15 p0256 A77-30316
- MUKHERJEE, P. W.  
Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells 16 p0420 A77-44059
- MUKHERJEE, S. K.  
Application of solar energy in the high-temperature range 13 p0063 A77-17636
- MUKHOPADHYAY, A. K.  
Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis 13 p0029 A77-12745
- MUKHOVATOV, V. S.  
Review of the state of the art with Tokamaks in USSR [EUR-CEA-PC-839-TR] 16 p0541 N77-31981
- MULLIGAN, J. C.  
Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings [PB-254665/3] 13 p0091 N77-10689
- MULLIN, J. P.  
Status of the NASA Space Power Program [AIAA PAPER 77-505] 14 p0173 A77-23922  
Technology for power in space 16 p0463 A77-48865
- MULLINGER, E.  
Investigation of the causes of stuck servovalves in U.S. Army hydraulic systems using MIL-H-46170 'Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base' [ASLE PREPRINT 77-AM-2A-1] 15 p0296 A77-35956
- MURBA, S. A.  
Solar absorption air-conditioning performance in central Ohio 14 p0168 A77-23443  
Energy conservation through residential solar retrofit 16 p0479 A77-48994
- MUR, J.  
High-efficiency and high-peak-power InP transferred-electron oscillators 15 p0289 A77-34366
- MURCHESNEY, F. C.  
Studies of biofouling in ocean thermal energy conversion plants 16 p0484 A77-49044
- MURD, K.  
Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems 13 p0064 A77-18019  
A comparison of porous silver catalysts in oxygen electrodes of alkaline fuel cells 13 p0067 A77-18350
- MURDKER, P.  
The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model [PB-264822/8] 16 p0517 N77-28628
- MURIS, R. E.  
Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire [AD-A031803] 14 p0228 N77-20393

- MUNN, R. E.  
Effects of anthropogenic emissions on climate - A review of selected topics 13 p0067 A77-18295
- MUNOZ-CANDELAPIO, E.  
Methanol from coal fuel and other applications [ORAU-126] 13 p0094 N77-11200
- MURSON, J. S.  
Energy situation in New England [BNL-50580] 15 p0381 N77-26650  
Briefing book on the energy situation in New England [BNL-21918] 16 p0515 N77-28599
- MURA, P. G.  
Design and testing of planar solar collectors 14 p0164 A77-23298
- MURA, T.  
Heat extraction from hot dry rock masses [PB-256775/8] 13 p0116 N77-13556  
Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 N77-28609
- MURAI, K.  
Studies on the energy system of Hokkaido. I - First attempt: Model-I. II - Various data and their basis. III - Simulations by Model-I 15 p0287 A77-33526
- MURATA, D.  
Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations 16 p0428 A77-46250
- MURIE, R. A.  
Post-test analysis of Li/Ps2 compact cells 16 p0448 A77-48739
- MURPHY, E. S.  
Current fusion power plant design concepts [BNWL-2013] 16 p0549 N77-32894
- MURPHY, G. L.  
Space construction base support requirements for environmental control and life support systems [ASME PAPER 77-ENAS-44] 16 p0432 A77-46885
- MURPHY, H. D.  
Extracting energy from hydraulically-fractured geothermal reservoirs 13 p0030 A77-12757  
Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing [LA-UR-76-1672] 14 p0221 N77-19597  
Extracting energy from hydraulically-fractured geothermal reservoirs [LA-UR-76-848] 14 p0221 N77-19598
- MURPHY, L. M.  
Coming - Solar power plants 13 p0016 A77-12125  
Development of the solar power central receiver concept [SAND-76-8677] 15 p0344 N77-22624
- MURPHY, T. D.  
Occupational radiation exposure at light water cooled power reactors, 1969-1975 [PB-257054/7] 13 p0125 N77-14740
- MURRAY, R. B.  
On the energy pattern factor in wind measurements 15 p0322 A77-38788  
On the optimum orientation of solar collectors 15 p0322 A77-38789
- MURRAY, R. W.  
Fuel cells and solid electrolytes [AD-A033782] 15 p0366 N77-24630
- MURRAY, T. J.  
A two-stage forecasting methodology for developing a national energy policy 16 p0419 A77-43144
- MURTHY, K. S.  
Reductant gases for flue gas desulfurization systems [PB-254168/8] 13 p0092 N77-10722
- MUSGROVE, P.  
Windmills change direction 13 p0060 A77-16620
- MUSSEY, W. W.  
In situ combustion of Michigan oil shale - Current field studies 13 p0024 A77-12695
- MY, T.  
Experimental investigation on a direct coal-fired MHD generator 14 p0141 A77-21238
- Experimental investigation of multiple-loaded diagonal conducting wall generators 15 p0325 A77-39529
- MYERS, A. L.  
Hydrogen production from water by means of chemical cycles 13 p0058 A77-16471
- MYERS, D.  
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine [NASA-CR-135119] 15 p0376 N77-26134
- MYERS, W. W.  
Mechanical thermal motor [NASA-CASE-NFS-23062-1] 13 p0104 N77-12402
- MYSELS, K. J.  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 16 p0457 A77-48812
- MYSEKOWSKI, A.  
Optimal parameters for solar cell films 14 p0150 A77-21805
- N**
- NAAIJER, C. J.  
Installation in Dakar of a pump powered by solar cell panels 16 p0546 N77-32589
- NABATOV, G. V.  
Study of the ionization of the additive in MHD installations 13 p0002 A77-10424
- NADKARNI, R. N.  
Comparative economics for the Arthur D. Little extractive coking process 13 p0022 A77-12684  
Comparative economics for the Arthur D. Little extractive coking process 15 p0301 A77-36340
- NADSHIP, A. E.  
Energy output and service life characteristics of high-voltage low-temperature thermopiles 16 p0442 A77-48517
- NABF, F. E.  
Economic aspects of Ocean Thermal Energy Conversion 16 p0484 A77-49041
- NAGARVALA, P. J.  
Regional energy system for the planning and optimization of national scenarios (RESFONS). Clean coal energy: Source-to-use economics project [ERDA-76-109] 14 p0222 N77-19602
- NAILL, R. F.  
Long-term natural resource availability: Environmental and political implications in the United States [PB-265762/5] 16 p0511 N77-28327
- NAJIM, S. E.  
Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilization 15 p0288 A77-33838
- NAJJAR, Y. S. H.  
Heavy-fuel flame radiation in gas turbine combustors - Exploratory results 16 p0508 A77-51589
- NAKAJIMA, Y.  
Design and performance of thermal storage water tank 13 p0075 A77-19079
- NAKAMURA, T.  
Hydrogen production from water utilizing solar heat at high temperatures 16 p0501 A77-50205  
An investigation of hydrogen production from water at high temperatures 14 p0240 N77-21607
- NAKAYAMA, N.  
Ceramic thin film CdTe solar cell 14 p0135 A77-19635
- NAKAYAMA, W.  
Fundamental research on heat transfer performances of solar focusing and tracking collector 16 p0502 A77-50223
- NALBANDIAN, S. J.  
Commercial applications of solar total energy systems 16 p0468 A77-48904



- MALESNIK, T.  
Coal liquefaction with soluble transition-metal complexes  
13 p0070 A77-18584
- MANHOONG, D.  
Experimental solar heating-cooling system model tests of a full-scale building system  
15 p0319 A77-38224  
Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation  
16 p0498 A77-49165  
Measured performance of a 3 ton LiBr absorption water chiller and its effect on cooling system operation  
[NASA-TM-X-73496]  
13 p0105 A77-12518  
Temperature distribution of a hot water storage tank in a simulated solar heating and cooling system  
[NASA-TM-X-73549]  
13 p0106 A77-12521
- MANHEN, L. W.  
An engineering feasibility study of using low temperature geothermal sources in Colorado  
13 p0031 A77-12762
- MAPOLI, L. S.  
High level concentration of sunlight on silicon solar cells  
15 p0267 A77-32208
- MAPOLITANO, L. G.  
Space and energy; Proceedings of the Twenty-sixth International Astronautical Congress, Lisbon, Portugal, September 21-27, 1975  
16 p0432 A77-46787
- WARDI, V.  
Energy storage, compression, and switching  
15 p0299 A77-36284
- NASH-WEBBER, J.  
Test results on the spinel electrode module in laboratory and simulated MHD environment  
14 p0140 A77-21227
- NASH-WEBBER, J. L.  
Design and performance of high temperature ceramic electrode modules  
15 p0327 A77-39543
- NASH, J. H.  
Long term performance prediction of residential solar energy heating systems  
13 p0039 A77-12822  
Unified simulation capability for solar heating and cooling system analysis  
16 p0479 A77-49003
- NASSAR, E. M.  
Analysis of the wind-driven reciprocator  
14 p0183 A77-26088
- NATABAJAN, M.  
Irreversibilities in thermochemical cycles for hydrogen production by water decomposition  
16 p0457 A77-48816
- NATHAN, K.  
Corrosion behavior of materials for coal-gasification applications  
15 p0337 A77-40029
- NATHAN, C. A.  
Solar power satellite construction - Issues and needed technology  
16 p0464 A77-48873
- NATHAN, R. A.  
Systems study of fuels from sugar cane, sweet sorghum, and sugar beets  
[TID-27032]  
14 p0211 A77-17570  
Systems study of fuels from sugarcane, sweet sorghum, sugar beets, and corn  
[TID-27336]  
15 p0377 A77-26324
- NAUS, D. A.  
Laboratory evaluation of solar power units for marine aids to navigation  
[AD-A034987]  
15 p0375 A77-25672
- NAY, H. W., JR.  
A status report on the USAFA solar energy program  
16 p0478 A77-48993  
Solar heating retrofit of military family housing  
[AD-A030843]  
14 p0226 A77-19659
- WATOWSKI, C. O.  
Studies of electric vehicle drives, illustrated by the example of an urban estate car  
14 p0160 A77-22893
- NAZARE, E.  
Aerothemic power plant with artificial cyclone  
13 p0077 A77-19098
- NAZEY, R. J.  
Production and processing of US tar sands: An environmental assessment  
[PB-266266/6]  
16 p0513 A77-28575
- NAZHA, M. A. A.  
Soot and gaseous pollutant formation in a burning fuel spray in relation to pressure and air/fuel ratio  
15 p0293 A77-35186
- NAZLI, M.  
Combined solar and petroleum energy HVAC system for a commercial building in Dhahran  
13 p0078 A77-19111
- NAZMY, M. Y.  
On the storage of solhydrogen  
13 p0075 A77-19073
- NEAL, J.  
Biphase turbines for diesel bottoming  
16 p0449 A77-48755
- NEASATALLA, E.  
Resource recovery technology for urban decision-makers  
[PB-252458/5]  
13 p0093 A77-10964
- NEARHOOP, S.  
Residential application of photovoltaic energy systems  
16 p0497 A77-49155
- NEDOSPASOV, A. V.  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- NEFERDOV, A. P.  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility  
14 p0142 A77-21257
- NEGAS, T.  
Crystallization and vaporization studies on synthetic coal slag compositions  
14 p0140 A77-21228  
The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility  
15 p0327 A77-39540
- NEIFERT, E. D.  
Solar energy: L-division miscellanea  
[UCID-17177]  
14 p0231 A77-20590
- NEIL, G.  
The photosynthetic production of hydrogen  
13 p0075 A77-19077  
The photosynthetic production of hydrogen  
15 p0278 A77-33368  
The photosynthetic production of hydrogen  
14 p0239 A77-21602
- NEILL, D. T.  
Geothermal powered heat pumps to produce process heat  
13 p0030 A77-12754
- NEITZEL, E. E.  
Study of unconventional aircraft engines designed for low energy consumption  
[NASA-CR-135136]  
13 p0127 A77-15043
- NELSON, E. E.  
Extended cryogenic performance of Lobar Wick heat pipe/radiator  
13 p0119 A77-14379
- NELSON, D.  
An assessment of wind-powered generators for navigational aids  
16 p0468 A77-48900
- NELSON, E. G.  
Potential structural material problems in a hydrogen energy system  
15 p0281 A77-33389  
Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems  
15 p0337 A77-40028  
Some studies on a solid state sulfur probe for coal gasification systems  
[NASA-TM-78428]  
16 p0534 A77-31605
- NELSON, J. E.  
Differential scanning calorimetry studies on coal. II - Hydrogenation of coals  
13 p0070 A77-18583
- NELSON, L. D.  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project  
[NASA-CR-149242]  
13 p0105 A77-12513

- NELSON, P. A.  
Batteries for utility load leveling  
[CONF-76C469-3] 14 p0231 N77-20579
- NELSON, B. H.  
Electrical behavior of slag coatings in coal-fired  
BHD generators 15 p0328 A77-39551  
Summary report of three powerplant productivity  
studies [PB-257764/1] 14 p0212 N77-17598
- NELSON, S.  
Assessment of energy storage technologies and  
systems. Phase I: Electric storage heating,  
storage air conditioning, and storage hot water  
heaters [ANL-ES-54] 15 p0394 N77-27547
- NELSON, S. H.  
Fuel cell benefit analysis [ANL-ES-51] 14 p0232 N77-20593  
Strategies for commercializing customer  
thermal-energy storage [ANL-ES-55] 16 p0557 N77-33649
- NELSON, T. J.  
Synthesis and analysis of jet fuel from shale oil  
and coal syncrudes [NASA-CR-135112] 13 p0103 N77-12230
- NEHAT-NASSEN, S.  
Heat extraction from hot dry rock masses  
[PB-256775/8] 13 p0116 N77-13556  
Heat extraction from hot, dry rock masses  
[PB-265116/4] 16 p0516 N77-28609
- NEHECHK, J. J.  
Application of chemical engineering to large scale  
solar energy 16 p0491 A77-49098  
Demand sensitive energy storage in molten salts  
16 p0491 A77-49102
- NEHESE, I.  
Mathematical method for determining reaction  
networks in chemical systems 16 p0418 A77-43093
- NEHETS, O. F.  
The U-240 cyclotron 13 p0046 A77-13151
- NEHADOVIC, M.  
Fundamentals of aerodynamic design: Propellers  
/2nd enlarged edition/ 15 p0317 A77-37949
- NEPHEW, E. A.  
Annual cycle energy system: Initial investigations  
[ORNL-TM-5525] 15 p0364 N77-24599  
Application of the ice-maker heat pump to an  
annual cycle energy system [CONF-761107-13] 15 p0382 N77-26659
- NEHRING, J.  
The sigma high energy advanced fuel direct  
conversion fusion power plant 13 p0035 A77-12794
- NEHRING, J. E.  
Advanced fuel fusion experimentation with  
Migmacells II and III - Orbit diagnostics and  
lifetime measurements 16 p0436 A77-47362  
Fusion products detection system in Migmacell II  
16 p0436 A77-47363
- NESBITT, D. M.  
Some impacts of restricting nuclear energy  
availability 16 p0415 A77-42857
- NESBITT, J. D.  
Assessment application for direct coal combustion  
[PB-263651/2] 15 p0359 N77-24318  
Survey of emissions control and combustion  
equipment data in industrial process heating  
[PB-263453/3] 15 p0368 N77-24674
- NEUGROSCHEL, A.  
Basic mechanisms governing solar-cell efficiency  
16 p0486 A77-49060
- NEVESKIN, O. A.  
Effect of solar-radiation density and angular size  
of radiation source on efficiency of solar power  
plants 14 p0143 A77-21312  
Some questions concerning the creation of a solar  
thermionic converter system 15 p0315 A77-37765  
Some problems involved in the development of a  
solar thermionic power plant 16 p0436 A77-47421
- NEVILLE, R. C.  
Solar energy and the residence - Some systems  
aspects 16 p0502 A77-50213
- NEWGARD, P. H.  
Long term energy alternatives for automotive  
propulsion. Synthetic fuel versus  
battery/electric system [PB-262512/7] 15 p0361 N77-24504  
Long term energy alternatives for automotive  
propulsion: Synthetic fuel versus  
battery/electric system [PB-262513/5] 15 p0361 N77-24505
- NEWHOUSE, P.  
Energy model data base program [BNL-21545] 14 p0250 N77-21687
- NEWHOUSE, P. H.  
Energy Model Data Base (EMDB) using system 2000  
[BNL-21854] 16 p0541 N77-31814
- NEWKIRK, H. W.  
Flat-plate solar collector handbook. A survey of  
principles, technical data and evaluation results  
[UCID-17086] 13 p0105 N77-12506  
Hydrogen storage by binary and ternary  
intermetallics for energy applications: A review  
[UCRL-52110] 15 p0394 N77-27548  
Environmental effects of energy production and  
utilization in the US. Volume 1: Sources,  
trends and costs of control [UCRL-51930-VOL-1] 16 p0530 N77-30645
- NEWKIRK, H. S.  
Economics of synthetic gas production by the SEGAS  
process 15 p0302 A77-36341
- NEWHAN, B. G.  
The spacing of wind turbines in large arrays  
16 p0416 A77-42893
- NEWHAN, G. H.  
Ambient temperature electric vehicle batteries  
based on lithium and titanium disulfide  
13 p0025 A77-12706
- NEWHAN, L.  
Further studies on the oxidation of sulfur dioxide  
in coal-fired power plant plumes 15 p0333 A77-39657  
Oxidation of sulfur dioxide in power plant plumes  
[BNL-21698] 15 p0386 N77-26713
- NEWTON, A. B.  
Optimizing solar cooling systems 13 p0047 A77-13502  
Why solar energy 14 p0170 A77-23654
- NEWTON, D. O.  
An evaluation of methanol, ethanol, the propanols,  
and the butanols as ship propulsion fuels  
[AD-A033483] 15 p0354 N77-23277
- NEWTON, G. E. H.  
Energy use in industry 13 p0005 A77-11029
- NGUYEN, K.  
Impact of a suburban rapid transit line of fuel  
consumption and cost for the journey-to-work.  
Analysis of the Philadelphia-Lindenwood  
high-speed line [PB-263048/1] 15 p0370 N77-25014
- NGUYEN, H.-H.  
The ecology of a marine littoral receiving  
effluents from a petroleum refinery 16 p0433 A77-47173
- NIAL, W. R.  
Design of a current technology electric vehicle  
16 p0446 A77-48727
- NICHOLAS, D. J. D.  
The photosynthetic production of hydrogen  
13 p0075 A77-19077  
The photosynthetic production of hydrogen  
15 p0278 A77-33368  
The photosynthetic production of hydrogen  
14 p0239 N77-21602
- NICHOLLS, J. A.  
Gas-fired heat pumps - An emerging technology  
14 p0195 A77-27891
- NICHOLS, D. G.  
An integrated process model of the Fischer-Tropsch  
process for liquid fuels production from coal  
15 p0318 A77-38213

- NICHOLS, K. E.  
Design and field test of a steam powered downhole geothermal pump  
16 p0456 A77-48806
- NICHOLS, L. D.  
Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator [NASA-TN-D-8374]  
14 p0213 N77-17852
- NICHOLSON-FLORENCE, E. B.  
Advanced fuel nuclear reaction feasibility using laser compression. II  
16 p0435 A77-47359
- NICHOLSON, E. W.  
Storage in oil of off-peak thermal energy from large power stations  
13 p0027 A77-12730
- NICOLESCU, T.  
Energy considerations related to the acquisition, supply, and utilization of solar energy  
14 p0203 A77-29572
- NIDA, A. V.  
Dual purpose nuclear power plants for military installations [AD-A026141]  
13 p0132 N77-15521
- NIELSEN, C. E.  
Experience with a prototype solar pond for space heating  
16 p0482 A77-49026  
Salt requirement and stability of solar ponds  
16 p0482 A77-49027
- NIGGENAW, R. E.  
KIPS - Kilowatt Isotope Power System  
13 p0041 A77-12837
- NIKAI, I.  
Energy conversion and storage by CDE /concentration difference energy/ engine and system  
16 p0459 A77-48831
- NILES, P. W.  
Design and performance of an air collector for industrial crop dehydration  
16 p0488 A77-49078
- NILES, P. W. B.  
Thermal evaluation of a house using a movable-insulation heating and cooling system  
13 p0019 A77-12407
- NINHO, B.  
Development of a mobile solar testing and recording /STAR/ system  
13 p0072 A77-19047
- NIRSCHL, J. C.  
A solar power radiometer [AD-A039995]  
16 p0539 N77-31658
- NISHIYA, K.-I.  
Studies on the energy system of Hokkaido. I - First attempt: Model-I. II - Various data and their basis. III - Simulations by Model-I  
15 p0287 A77-33526
- NISHIYAMA, Y.  
Gasification of coals treated with non-aqueous solvents. I - Liquid ammonia treatment of a bituminous coal  
14 p0198 A77-28778
- NITSCH, J.  
The storage of energy in future energy supply systems [DGLR PAPER 76-182]  
13 p0059 A77-16533  
Production of chemical energy carriers by non-expandable energy sources [DLR-FB-76-32]  
13 p0114 N77-13541  
Production of chemical energy carriers by non-expandable energy sources [ESA-TT-338]  
14 p0251 N77-21701
- NITSKEVICH, E. A.  
Problems involved in improving the industrial fuel and energy balance  
13 p0012 A77-11347
- NIXON, J. D.  
New turbodrill for geothermal drilling  
16 p0456 A77-48810
- NIXON, J. B.  
HYCOS - A solar heating, cooling and energy conversion system based on metal hydrides  
13 p0029 A77-12740
- NOZ, J. C.  
Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800
- NOGGLE, L. W.  
The military utility of very large airplanes and alternative fuels  
16 p0434 A77-47271  
The potential of liquid hydrogen as a military aircraft fuel [AD-A026666]  
13 p0118 N77-14272  
An evaluation of very large airplanes and alternative fuels [AD-A040532]  
16 p0532 N77-31334
- NOLAN, M. E.  
Development of fuel cell CO detection instruments for use in a mine atmosphere [PB-254823/8]  
13 p0095 N77-11380
- NOLL, K. E.  
Power generation: Air pollution monitoring and control  
16 p0504 A77-51126
- NOLL, S.  
Solar energy: Policy and prospects [PB-267986/8]  
16 p0554 N77-33620
- NORCO, J. E.  
The air quality and economic implications of supplementary control systems in Illinois [PB-255699/1]  
13 p0101 N77-11588
- NORCROSS, D. W.  
Applied research in the general area of charged particle chemistry related to coal-fired MHD [PB-263873/2]  
15 p0387 N77-26987
- NORDIO, M.  
Combined production of electrical power and desalinated water by nuclear power plants  
15 p0255 A77-30100
- NOREN, J.  
Plasma heating systems planned for the Argonne experimental power reactor  
16 p0407 A77-41712
- NORMAN, J. B.  
Water splitting - A progress report  
15 p0274 A77-33330  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- NORTH, P.  
An analysis of the role of energy in solid waste utilization and disposal  
14 p0182 A77-26070
- NORTHROP, D. A.  
The status of instrumentation and process control techniques for in situ coal gasification  
14 p0191 A77-26790
- NORTHRUP, L. M.  
A practical solar concentrator  
14 p0171 A77-23657
- NORTON, J.  
Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power [ERDA-76-69]  
13 p0130 N77-15506
- NORTON, R. L.  
Reliability study of vapor recovery systems at service stations [PB-267613/8]  
16 p0560 N77-33700
- NOSACH, V. G.  
Combined utilization of nuclear and organic fuels  
15 p0272 A77-33159
- NOSEK, S. M.  
Ceramics for the advanced automotive gas turbine engine: A look at a single shaft design [NASA-TN-X-73651]  
15 p0354 N77-23490
- NOTON, B. E.  
Factors affecting the corporate decisionmaking process of air transport manufacturers [NASA-CR-154618]  
15 p0387 N77-27020
- NOVAK, M. E.  
Advanced fuel nuclear reaction feasibility using laser compression. II  
16 p0435 A77-47359
- NOVAKOV, T.  
Raman scattering and the characterisation of atmospheric aerosol particles  
15 p0262 A77-31487
- NOVIKOV, E. I.  
Processing of experimental data with the U-25 facility with the aid of a data measuring system  
15 p0269 A77-32521

- NOVOSAD, R.  
An analysis of the role of energy in solid waste utilization and disposal 14 p0182 A77-26070
- NOVOTNY, P.  
Method and equipment for the introduction of liquid waste fuels into a fluidized layer [BLL-ETS-10400] 15 p0359 A77-24205
- NOVACK, C. J.  
Evaluation of a JP-5 type fuel derived from oil shale [AD-A025417] 13 p0112 A77-13231
- NOYELLE, T.  
Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work. Analysis of the Philadelphia-Lindenwold high-speed line [PB-263048/1] 15 p0370 A77-25014
- NOZAKI, K.  
Concept of a fusion burner 13 p0061 A77-17014
- NOZIK, A. J.  
Energy conversion via photoelectrolysis 13 p0021 A77-12667  
Hydrogen generation by photoelectrolysis of water 14 p0240 A77-21605
- NULLER, T. A.  
Investigation of p-Al<sub>x</sub>/Ga<sub>1-x</sub>/As-n-GaAs heterojunction cells by means of optical measurements and photoluminescence spectra 14 p0143 A77-21311
- NUMANO, M.  
Elimination of current concentration due to Hall effect by variable resistive electrodes 16 p0418 A77-43119
- NUNN, R. B.  
International Symposium on Wind Energy Systems [AD-A034871] 15 p0366 A77-24627
- NURGALIEV, R. M.  
Determination of the non-equilibrium MHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor 15 p0326 A77-39537
- NUSSEBERGER, A. A.  
A solar power system with gallium arsenide solar cells [AIAA PAPER 77-519] 14 p0174 A77-23932
- NUTI, S.  
Locating interesting geothermal areas in the Tuscany region /Italy/ by geochemical and isotopic methods 13 p0013 A77-11498
- NUTTALL, H. E., JR.  
Pyrolysis kinetics for oil-shale particles 16 p0401 A77-41316
- NUTTALL, R. L.  
Estimation of net enthalpies of combustion of some aviation fuels expressed in the international system of units (SI) [NBS-TN-937] 16 p0550 A77-33370
- NYDICK, S. E.  
A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255658/7] 13 p0115 A77-13542  
A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries [PB-255659/5] 13 p0115 A77-13543
- OBERHOLZER, J. E.  
Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment [PB-269270/5] 16 p0561 A77-34058
- OBERLE, R. D.  
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [FE-2307-2] 14 p0224 A77-19637  
Survey of emissions control and combustion equipment data in industrial process heating [PB-263453/3] 15 p0368 A77-24674
- OBERLY, C. E.  
Air Force applications of lightweight superconducting machinery 14 p0144 A77-21360
- OBERHEIZER, J. L.  
An economic evaluation of small-scale wind powered electric generation systems [ASME PAPER 76-WA/ENER-1] 14 p0185 A77-26430
- OBLAD, A. G.  
Recovery of bitumen from oil-impregnated sandstone deposits of Utah 14 p0194 A77-27349
- O'BRIEN, P.  
Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory [PB-262980/6] 15 p0356 A77-23619
- O'BRIEN, J.  
Some institutional problems of residential solar heating 16 p0495 A77-49130
- OCALLAGHAN, P. W.  
Thermal accumulators 15 p0264 A77-31673  
Energy management 15 p0304 A77-36424
- OCONEWELL, L. G.  
Methanol engine: A transportation strategy for the post-petroleum era [UCRL-52041] 14 p0219 A77-19469  
Battery-flywheel hybrid electric power system for near term application. Volume 2: System design [UCID-17098-VOL-2] 14 p0228 A77-20443
- ODINTSOV, A. I.  
Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser 15 p0289 A77-34221
- ODONNELL, P.  
The Redox flow system for solar photovoltaic energy storage [NASA-TN-X-73562] 13 p0106 A77-12522
- ODSTRCIL, D.  
Future space experiments with levitated capacitor for thermonuclear microexplosions [IAF PAPER 77-ST-11] 16 p0508 A77-51575
- ODUM, H. T.  
Energy analysis and the coupling of man and estuaries 15 p0290 A77-34449  
A United States energy model economically driven by a global growth simulation 15 p0319 A77-38220
- OESTERWIND, D.  
The future importance of solar energy for the supply of the German Federal Republic with energy 13 p0070 A77-18597
- OETKING, P.  
Development of an assessment methodology for geopressured zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in South Texas [COO-2687-4] 14 p0215 A77-18564  
Development of an assessment methodology for geopressurized zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in south Texas [COO-2687-5] 15 p0361 A77-24571
- OETTINGER, P. E.  
High efficiency thermionic converter studies [NASA-CR-135263] 16 p0546 A77-32592
- OFFEN, G. R.  
Alternate petroleum based fuels for naval fleet usage: potential availability, cost, and system impact [AD-A041980] 16 p0551 A77-33372
- OFFENHARTZ, P. O.  
Study of silica scaling from geothermal brines [PB-262890/7] 15 p0357 A77-23626
- OFFENHARTZ, P. O'D.  
Chemical methods of storing thermal energy 16 p0491 A77-49100
- OGANOV, E. P.  
Effect of heat transfer from lateral surfaces of semiconductor thermoelements on the power output of thermoelectric converters 13 p0058 A77-16324
- OGILVIE, D. G.  
Summary of EPA energy policy analysis [PB-253361/0] 13 p0089 A77-10669
- OGLE, M. C.  
Transportation energy conservation data book [ORNL-5198] 13 p0086 A77-10643

- OHARA, J. B.  
Preliminary economic analysis - Oil and power by  
COED-based coal conversion 15 p0301 A77-36338
- OHASHI, K.  
Cathodes for photodriven hydrogen generators -  
ZnTe and CdTe 15 p0296 A77-35921  
Hydrogen and electricity from water and light 16 p0430 A77-46609
- OHISHI, H.  
Photocell using covalently-bound dyes on  
semiconductor surfaces 16 p0412 A77-42412
- OHTA, T.  
Hydrogen production using solar radiation 13 p0048 A77-13540  
Water-splitting-system synthesized by  
photochemical and thermoelectric utilizations of  
solar energy 15 p0274 A77-33334
- OHUE, J.  
Solar space heating and cooling with B1-heat  
source heat pump and hot water supply system 14 p0158 A77-22643
- OIZON, R.  
Geography of energy production in France. V - The  
markets of consumption: The Paris region and the  
Lyon, Strasbourg and Rennes areas 16 p0427 A77-45712
- OJALVO, S. I.  
Energy balance for anaerobic digestion 14 p0138 A77-20999
- OKERFE, D. R.  
Development of a sulfur-iodine thermochemical  
water-splitting cycle for hydrogen production 16 p0457 A77-48812
- OKUDA, A. S.  
Design criteria for reducing pollutant emissions  
and fuel consumption by residential oil-fueled  
combustors [ASME PAPER 76-WA/PO-10] 14 p0185 A77-26457
- OLDS, F. C.  
The availability of fuels for power plants 13 p0010 A77-11316
- OLEARY, B.  
The construction of satellite solar power stations  
from non-terrestrial materials [AIAA PAPER 77-354] 13 p0066 A77-18259  
Mass driver retrievals of earth-approaching  
asteroids [AIAA PAPER 77-528] 15 p0265 A77-32053  
Space applications for terrestrial resources 15 p0320 A77-38477  
Mining the Apollo and Amor asteroids 16 p0400 A77-40648
- OLEARY, J.  
Thermal energy storage considerations for  
solar-thermal power generation 13 p0027 A77-12732
- OLEVINSKII, K. K.  
Thermodynamic analysis of the formation of the  
oxides of nitrogen and sulfur in fuel combustion  
products 15 p0269 A77-32506
- OLIER, R.  
Description of a new photoelectrochemical generator 14 p0150 A77-21812
- OLIVER, D. A.  
Consideration of three-dimensional effects in MHD  
power generators 14 p0142 A77-21261  
Coupled electrical and fluid calculations in the  
cross plane in linear MHD generators 15 p0329 A77-39557
- OLIVER, E. D.  
Long term energy alternatives for automotive  
propulsion. Synthetic fuel versus  
battery/electric system [PB-262512/7] 15 p0361 A77-24504  
Long term energy alternatives for automotive  
propulsion: Synthetic fuel versus  
battery/electric system [PB-262513/5] 15 p0361 A77-24505
- OLIVER, R. C.  
DoD energy R and D. Part 2: Military fuel  
operations. Performance and R and D implications  
[AD-A042272] 16 p0554 A77-33617
- OLIVER, T. K.  
Energy from humid air [AIAA PAPER 77-730] 15 p0311 A77-37253
- OLKHOVSKII, G. G.  
Heat tests with a GT-35 gas turbine as an element  
of steam-gas facility with a high-pressure steam  
generator 14 p0136 A77-20109  
Investigating the starting modes of the GT-35 gas  
turbine plant 16 p0426 A77-45324
- OLLENDORF, S.  
The International Heat Pipe Experiment 13 p0120 A77-14389
- OLLILA, R. G.  
Factors affecting the corporate decisionmaking  
process of air transport manufacturers [NASA-CR-154618] 15 p0387 A77-27020
- OLSEN, H. L.  
Design of low-cost aluminum heat exchangers for  
OTEC plant-ships 16 p0485 A77-49046  
Internal heat transfer experiments in a simulated  
OTEC evaporator tube [APL/JHU/AEO-76-066] 16 p0521 A77-29611
- OLSEN, L. C.  
Model calculations for  
metal-insulator-semiconductor solar cells 16 p0500 A77-50050  
Investigation of low cost solar cells based on Cu<sub>2</sub>O  
[PB-258583/4] 14 p0217 A77-18582  
Investigation of low cost solar cells based on Cu<sub>2</sub>O  
[PB-258746/7] 14 p0217 A77-18583
- OLSEN, T. G.  
Solar air conditioning applications for warm humid  
climate 16 p0496 A77-49147
- OLSON, C. D.  
Crystallization and vaporization studies on  
synthetic coal slag compositions 14 p0140 A77-21228
- OLSON, C. L.  
Personal rapid transit research conducted at the  
Aerospace Corporation [PB-256846/7] 13 p0111 A77-12946
- OLSON, J. S.  
Development and applications of spatial data  
resources in energy related assessment and  
planning [CONP-761017-1] 15 p0355 A77-23609
- OLSON, R. J.  
Development and applications of spatial data  
resources in energy related assessment and  
planning [CONP-761017-1] 15 p0355 A77-23609
- OLSON, T. L.  
Earthquake surveys of the Roosevelt Hot Springs  
and the Cove Fort areas, Utah, volume 4  
[PB-268421/5] 16 p0544 A77-32574
- OLSZEWSKI, B.  
Waste heat vs conventional systems for greenhouse  
environmental control: An economic assessment  
[ORNL-TM-5069] 13 p0088 A77-10656
- OLVER, L. A.  
Regional energy system for the planning and  
optimization of national scenarios (RESPONS).  
Clean coal energy: Source-to-use economics  
project [ERDA-76-109] 14 p0222 A77-19602
- OMAN, H.  
Photovoltaic solar power satellites 16 p0463 A77-48866
- OMAN, R. A.  
Fluid dynamics of diffuser augmented wind turbines 16 p0467 A77-48899  
Diffuser augmentation of wind turbines 16 p0490 A77-49093  
Diffuser augmentation of wind turbines  
[CONP-760842-6] 16 p0521 A77-29610
- OMBERG, R. P.  
Economic analysis of the need for advanced power  
sources [HEDL-SA-989] 13 p0131 A77-15509
- ONEARA, J. E.  
Design and construction of a residential solar  
heating system at Fermilab 16 p0476 A77-48977

- OMURTAG, Y.  
A two-stage forecasting methodology for developing  
a national energy policy 16 p0419 A77-43144
- ONEILL, P.  
Particulate nature of solar absorbing films - Gold  
black 14 p0163 A77-22982
- ONEILL, T. B.  
The biodegradation of oil in sea water for naval  
pollution control [AD-A042375] 16 p0560 N77-33688
- ONG, C. M.  
The interaction of batteries and fuel cells with  
electrical distribution systems - Line  
commutated converter interface 16 p0414 A77-42634  
The interaction of batteries and fuel cells with  
electrical distribution systems - Force  
commutated converter interface 16 p0414 A77-42635
- ONIGA, T.  
Solar powered steam generation 16 p0459 A77-48832
- ONISCHAK, M.  
Heat transfer analysis of metal hydrides in  
metal-hydrogen secondary batteries 15 p0278 A77-33363  
Heat transfer analysis of metal hydrides in  
metal-hydrogen secondary batteries 14 p0239 N77-21597
- ONSTOTT, E. I.  
Thermochemical cycles utilizing sulfur for  
hydrogen production from water 15 p0276 A77-33353
- OOK, R. L.  
A method of comparing flat-plate air and liquid  
solar collectors for use in space heating  
applications 16 p0472 A77-48941
- OPILA, R. J.  
Pyrolysis of oil shale: The effects of thermal  
history on oil yield [UCRL-77831] 13 p0129 N77-15499
- ORAZMUKHAMEDOV, M.  
Equations for cold production of an absorption  
refrigerating solar unit 14 p0137 A77-20397
- ORDIN, P. M.  
Bibliography on Liquefied Natural Gas (LNG) safety  
[NASA-TM-X-73408] 13 p0127 N77-15208
- OREN, M.  
Silicon thin film crystallization and solar cell  
fabrication [PB-261715/7] 15 p0348 N77-22670
- ORGILL, J. P.  
Correlation equation for hourly diffuse radiation  
on a horizontal surface 16 p0422 A77-44481
- WATSON: A solar heating simulation and economic  
evaluation program [NP-21307] 15 p0364 N77-24603  
Determining the technical and economic feasibility  
of utilizing solar energy for heating buildings  
in Canada [NP-21308] 15 p0365 N77-24611
- ORLOV, A. V.  
Processing of experimental data with the U-25  
facility with the aid of a data measuring system 15 p0269 A77-32521
- ORTAPASI, U.  
Indoor test methods to determine the effect of  
vacuum on the performance of a tubular flat  
plate collector [ASME PAPER 76-WA/SOL-24] 14 p0190 A77-26529  
A tubular evacuated solar collector utilizing a  
heat pipe as absorber 16 p0417 A77-42961
- ORTH, R. C.  
Direct-connect tests of hydrogen-fueled supersonic  
combustors 16 p0440 A77-48240
- ORTIZ, L. W.  
Aerosol research and development related to health  
hazards analysis [LA-6539-PR] 15 p0385 N77-26703
- ORUNOV, B. B.  
Thermodynamic analysis and selection of optimal  
parameters of a dynamic converter for a solar  
energy set-up 13 p0051 A77-14580  
Thermodynamic analysis and choice of optimal  
parameters of dynamic converter for solar energy  
plant 15 p0291 A77-34974
- OSA, T.  
Photocell using covalently-bound dyes on  
semiconductor surfaces 16 p0412 A77-42412
- OSHEA, K. R.  
Ellipsometry in the study of selective  
radiation-absorbing surfaces 16 p0406 A77-41581
- OSMEYER, W. E.  
The low cost high performance generator /LCHPG/  
13 p0042 A77-12855  
The selenide isotope generators [AIAA PAPER 77-498] 14 p0173 A77-23916
- OSOBA, J. S.  
Development of an assessment methodology for  
geopressured zones of the upper Gulf Coast based  
on a study of abnormally pressured gas fields in  
South Texas [COO-2687-4] 14 p0215 N77-18564  
Development of an assessment methodology for  
geopressured zones of the upper Gulf Coast  
based on a study of abnormally pressured gas  
fields in South Texas [COO-2687-5] 15 p0361 N77-24571
- OSOWSKI, D. E.  
Energy resources alternatives competition  
[COO-2698-1] 14 p0224 N77-19635
- OSTASHEV, V. E.  
Limiting capabilities with respect to electric  
power generation of a pulsed MHD generator  
operating at a resistive load 13 p0064 A77-17917  
Threshold capabilities of a pulsed MHD converter  
for the production of electric power with a  
resistive load 16 p0399 A77-40591
- OSTROVSKI, C. M.  
A feasibility study of bio-gas production in  
individual farms in Southwestern Ontario 16 p0489 A77-49082
- OSWALD, W. J.  
Gas production from micro algae 15 p0314 A77-37665  
The photosynthesis energy factory - Analysis,  
synthesis, and demonstration 16 p0449 A77-48753
- OTA, K.  
Thermochemical hydrogen production via a cycle  
using barium and sulfur - Reaction between  
barium sulfide and water 15 p0321 A77-38529
- OTAGAWA, T.  
Water-splitting-system synthesized by  
photochemical and thermoelectric utilizations of  
solar energy 15 p0274 A77-33334
- OTIS, J. L.  
Systems study of fuels from sugar cane, sweet  
sorghum, and sugar beets [TID-27032] 14 p0211 N77-17570  
Systems study of fuels from sugarcane, sweet  
sorghum, sugar beets, and corn [TID-27336] 15 p0377 N77-26324
- OTKUN, G.  
Geothermal energy in Saudi Arabia and its use in  
connection with solar energy 13 p0079 A77-19122
- OTSUKI, H. E.  
Recent developments in the engineering and  
chemistry of the ZnSe thermochemical hydrogen  
cycle 16 p0457 A77-48815
- OTTAR, B.  
Organization of long range transport of air  
pollution monitoring in Europe 13 p0071 A77-18754
- OTTESEN, D. K.  
High temperature thermal energy storage 16 p0491 A77-49099

- Survey of high temperature thermal energy storage  
[SAND-75-8063] 13 p0088 N77-10655
- OTWELL, W.**  
A retrofit solar heating system constructed with  
salvaged and readily available components  
designed for self-installation by low income  
families 16 p0479 A77-48998
- OUVELLETTE, R.**  
Survey of alcohol fuel technology, volume 1  
[PB-2560C7/6] 13 p0112 N77-13232
- OWENS, C. D.**  
Does solar energy demand more land surface, and  
more materials or energy investment than nuclear  
energy or fossil fuels - A preliminary study 14 p0155 A77-21857
- OVCHINNIKOV, V. S.**  
Some questions concerning the creation of a solar  
thermionic converter system 15 p0315 A77-37765  
Some problems involved in the development of a  
solar thermionic power plant 16 p0436 A77-47421
- OVERBOLT, W.**  
Domestic and world trends (1980 - 2000) affecting  
the future of aviation [NASA-CR-144838] 13 p0126 N77-14981
- OVERSON, L. D.**  
The application of wind power systems to the  
Minnesota Power and Light Company 16 p0490 A77-49092
- OVI, A.**  
Statistical utility theory for comparison of  
nuclear versus fossil power plant alternatives 15 p0291 A77-35015
- OWEN, T. S.**  
Santa Clara, California, community center,  
commercial solar demonstration legal  
alternatives, implications, and financing of  
solar heating and cooling by a municipal  
corporation [SAN/1083-76/1] 15 p0394 N77-27549
- OWENS, E. C.**  
Engine performance and fire-safety characteristics  
of water-containing diesel fuels [AD-A036011] 15 p0377 N77-26330
- OWENS, K.**  
Can new resources fill the energy gap 14 p0166 A77-23380
- OWREN, H. B.**  
Update on the development of 120-keV  
multi-megawatt neutral beam source 15 p0335 A77-39749
- OXBURGH, E. B.**  
Geothermal energy 13 p0005 A77-11035
- OYLE, D. C.**  
Degasification and production of natural gas from  
an airshaft in the Pittsburgh coalbed  
[PB-258101/5] 14 p0210 N77-17555
- OZAWA, Y.**  
Electrical and thermal instabilities in the  
electrode surface region in a combustion MHD  
generator channel 15 p0328 A77-39550
- P**
- PACKARD, C.**  
The New Mexico Department of Agriculture solar  
heated and cooled building [ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515  
A solar heated and cooled office building 16 p0475 A77-48966
- PACKO, A. A.**  
Corrosivity of geothermal brines [ORNL-TM-5688] 15 p0359 N77-24265
- PADREIN, L. IA.**  
Investigation of composite radiant-energy  
concentrators with conical radiation sources 14 p0143 A77-21313  
Composite concentrators with spherical radiation  
sources 14 p0179 A77-25359  
Composite concentrators with spherical radiation  
sources 16 p0409 A77-41909
- PADIA, A.**  
Effects of devolatilization kinetics and ash  
behavior on coal fired MHD combustor design 14 p0141 A77-21248
- PADILLO, R.**  
Solar collection systems - The rationale 15 p0304 A77-36426
- PAFFRATH, D.**  
Mathematical simulation and empirical  
determination of the aerochemical and thermal  
atmospheric pollution resulting from energy  
conversion processes [DLR-IB-553-75/1] 13 p0091 N77-10700
- PAIGE, W. A.**  
COGAS status report 15 p0317 A77-38100
- PALANKER, V. SH.**  
Highly dispersed tungsten carbide for fuel cells  
with an acidic electrolyte 13 p0055 A77-15815
- PALLOTTINO, G. V.**  
Some preliminary considerations on photovoltaic  
conversion of solar energy 14 p0164 A77-23299
- PALMA, P.**  
Basic research problems in the generation of  
electrochemical energy for powering small  
private vehicles 14 p0180 A77-25721
- PALMEDO, P. P.**  
Energy technology assessment - Considerations of  
geographical scale 15 p0309 A77-36822  
Energy situation in New England [BNL-50580] 15 p0381 N77-26650  
Briefing book on the energy situation in New England  
[BNL-21918] 16 p0515 N77-28599  
Role of renewable energy technologies in  
developing countries [BNL-22311] 16 p0556 N77-33638
- PALMER, D. W.**  
The 275 deg C microcircuitry: Resistors,  
capacitors, conductors, substrates, and bonding  
[SAND-76-0611] 15 p0389 N77-27312
- PALMER, R. B.**  
High temperature solar collector with an  
Archimedes concentrator 16 p0460 A77-48833
- PALMER, R.**  
Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405  
Energy storage possibilities of atomic hydrogen 14 p0245 N77-21643
- PALMIERI, T. E.**  
The strategic petroleum reserve and liquefied  
natural gas supplies [PB-265488/7] 16 p0520 N77-29598
- PALZ, W.**  
Utilization of solar power - A new departure 13 p0053 A77-15049  
Evaluation of CdS photovoltaic cells in the  
framework of the development of solar electric  
power plants 14 p0149 A77-21796
- PAN, Y. C.**  
Carbon oxidation catalyst mechanism study for fuel  
cells [PB-256420/1] 13 p0115 N77-13551
- PANDOLFINI, P. P.**  
Design of low-cost aluminum heat exchangers for  
OTEC plant-ships 16 p0485 A77-49046  
Internal heat transfer experiments in a simulated  
OTEC evaporator tube [APL/JHU/AEO-76-066] 16 p0521 N77-29611
- PANERVIN, I. G.**  
Structure of the electric field in the near-end  
space of a cylindrical electrode 15 p0295 A77-35607
- PANGBORN, J.**  
Experimental demonstration of an iron chloride  
thermochemical cycle for hydrogen production 13 p0032 A77-12772  
Laboratory investigations on thermochemical  
hydrogen production 15 p0276 A77-33348  
Technical prospects for commercial and residential  
distribution and utilization of hydrogen 15 p0283 A77-33404

- PANGBORN, J. B.  
Wind-powered hydrogen electric systems for farm  
and rural use  
[PB-259318/4] 14 p0226 N77-19667  
Laboratory investigations on thermochemical  
hydrogen production 14 p0238 N77-21580  
Technical prospects for commercial and residential  
distribution and utilization of hydrogen 14 p0245 N77-21642
- PANICHI, C.  
Isotopic composition of steam samples from  
Lanzarote, Canary Islands 13 p0013 A77-11497
- PANICKER, N. N.  
Power resource estimate of ocean surface waves 13 p0071 A77-18790
- PANOFISKY, H. A.  
Wind structure in strong winds below 150 m 16 p0410 A77-42071
- PANOV, P. A.  
The quality category in solar engineering 14 p0143 A77-21310  
The use of lasers for the inspection of  
heliotechnical reflectors 15 p0286 A77-33432  
Using lasers to inspect solar-energy reflectors 16 p0427 A77-45545
- PANOVKO, M. IA.  
Effect of nonuniform conductivity in the boundary  
layer at the electrode wall on local  
characteristics of an MHD generator with a  
diagonal electrode configuration and a subsonic  
stream 13 p0001 A77-10423
- PANZHAUSER, E.  
Application of solar heat to buildings in Austria 13 p0079 A77-19114
- PAPRICI, C.  
Preparation and characteristics of CuGaSe<sub>2</sub>/CdS  
solar cells 13 p0069 A77-18517
- PAPANARCOS, J.  
Combined cycles and refined coal 13 p0058 A77-16249  
Stack gas cleanup 15 p0317 A77-37939
- PAPINI, P.  
Effect of optical properties of a surface exposed  
to solar radiation on the radiation balance 13 p0052 A77-14928  
Study and materialization of a selective surface  
designed for direct thermal conversion of solar  
energy - Application to medium temperature range 13 p0069 A77-18496  
Contribution to the study of solar energy  
collectors - Selective plates and cells 13 p0072 A77-19051  
Antiloss cell structures - Coupling with a  
selective surface 14 p0148 A77-21790  
Tradeoff between selectivity and concentration in  
the collection of solar energy 14 p0150 A77-21810
- PAPPAS, J. L.  
The Wisconsin Regional Energy project - An applied  
systems analysis approach to regional  
energy/environment modeling 15 p0309 A77-36825
- PAPROTNY, Z.  
On the active and passive CETI from earth  
satellite orbit  
[IAF PAPER A-77-48] 16 p0507 A77-51524
- PARADJANIN, L. J.  
Some aspects of heat and mass transfer in  
geothermal wells 14 p0175 A77-24209
- PARDUE, W. B.  
Heat source component development program  
[BNI-X-676] 16 p0536 N77-31632
- PARIKH, S.  
Optimization models for planning economic  
development  
[AD-A039165] 16 p0531 N77-31024
- PARIKH, J. K.  
Energy from bio-conversion for developing countries 15 p0270 A77-32592
- PARIKH, S. C.  
Energy models and large-scale systems optimization  
[AD-A033736] 15 p0365 N77-24619
- PARK, G. L.  
Application study of wind power technology to the  
city of Hart, Michigan  
[COO-2603-1] 14 p0212 N77-17582
- PARK, J.  
Operational experience with small wind units 13 p0044 A77-12873
- PARK, W.  
Survey of alcohol fuel technology, volume 1  
[PB-256007/6] 13 p0112 N77-13232  
Survey of alcohol fuel technology, volume 2  
[PB-256008/4] 13 p0112 N77-13233
- PARKER, G. B.  
Nuclear driven water decomposition plant for  
hydrogen production 13 p0035 A77-12791
- PARKER, G. J.  
A forced circulation system for solar water heating 13 p0019 A77-12413
- PARKER, J. B., JR.  
High speed superconducting generator 14 p0144 A77-21383
- PARKER, B. R.  
The physics of magnetic separation 15 p0323 A77-39119
- PARKER, B. S.  
Servo positioning power tower collectors for solar  
heat conversion to electricity 14 p0198 A77-28811
- PARKINSON, W. B.  
Measurements of Sc I gf-values 13 p0058 A77-16270
- PARRISH, W. B.  
Helium research in support of superconducting  
power transmission  
[PB-265076/0] 15 p0390 N77-27326
- PARRY, W. T.  
Geochemistry and hydrothermal alteration at  
selected Utah hot springs, volume 3  
[PB-264415/1] 15 p0378 N77-26606
- PARSONS, J.  
Coal fired non-equilibrium closed cycle MHD power  
plant system since ECAS 15 p0332 A77-39576
- PARSONS, R. B.  
LLL-Sohio solar process heat project. Report no.  
3: LLL solar energy group  
[UCID-16630-3] 13 p0123 N77-14604
- PARSONS, W. B.  
Risk management of liquefied natural gas  
installations 13 p0002 A77-10451
- PASCAL, E. P.  
TRISNET. Directory to transportation research  
information resources  
[PB-255172/9] 13 p0125 N77-14939
- PASCIAK, W. J.  
Occupational radiation exposure at light water  
cooled power reactors, 1969-1975  
[PB-257054/7] 13 p0125 N77-14740
- PASHKIN, S. V.  
Shock tube for investigations of high-temperature  
MHD generators 13 p0054 A77-15665
- PASHKOV, S. A.  
Problems of analysis of the power characteristic  
of a high capacity magnetohydrodynamic power  
station 14 p0143 A77-21270
- PASICHNY, V. V.  
Studies of technological processes by solar energy  
under cosmic simulated conditions  
[IAF PAPER 77-54] 16 p0506 A77-51411
- PASQUALETTI, M. J.  
Energy in an oasis: Geothermal resource  
development in the Imperial Valley of California 16 p0552 N77-33598
- PASQUETTI, R.  
Effect of optical properties of a surface exposed  
to solar radiation on the radiation balance 13 p0052 A77-14928  
Study and materialization of a selective surface  
designed for direct thermal conversion of solar  
energy - Application to medium temperature range 13 p0069 A77-18496



- Contribution to the study of solar energy collectors - Selective plates and cells  
13 p0072 A77-19051
- Antiloss cell structures - Coupling with a selective surface  
14 p0148 A77-21790
- Tradeoff between selectivity and concentration in the collection of solar energy  
14 p0150 A77-21810
- PATANKAR, S. V.  
Heat transfer - A review of 1975 literature  
13 p0002 A77-10615
- PATE, A. J.  
Design of a low cost space heating system using warm geothermal or industrial effluents [ASME PAPER 77-DE-26]  
16 p0432 A77-46909
- PATEL, J. G.  
The IGT low-Btu gas process - Design and economics  
15 p0301 A77-36335
- PATEL, N. J.  
Influence of coal type and drying upon MHD power plants and components  
14 p0140 A77-21231
- PATEL, P. S.  
Combined diesel-organic Rankine-cycle power plant  
16 p0459 A77-48830
- PATERSON, J. A.  
Update on the development of 120-keV multi-megawatt neutral beam source  
15 p0335 A77-39749
- PATIN, P.  
Energy recovery in railway and road transportation  
13 p0051 A77-14564
- PATSCH, F.  
Flow in geothermal hot water wells  
14 p0163 A77-23037
- PATTERSON, R. P.  
Growth and characterization of thin-film compound semiconductor photovoltaic heterojunctions  
14 p0162 A77-22978
- PATTON, J. T.  
Energy and protein production from pulp mill wastes [COO-2983-2]  
16 p0557 A77-33645
- PAU, J.  
Initial environmental test plan for source assessment of coal gasification [PB-261916/1]  
15 p0350 A77-22705
- PAUL, S.  
A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs  
13 p0014 A77-11591
- PAUWELS, H.  
Calculation of the efficiency of a heterojunction solar cell  
14 p0151 A77-21821
- PAUWELS, H. J.  
Collection efficiency of heterojunction solar cells  
15 p0258 A77-30722
- PAYNE, H. E.  
MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems [ORNL-HUD-MIUS-6]  
14 p0249 A77-21684
- PATZER, R. J.  
Variable cycle engine applications and constraints  
15 p0339 A77-22125
- PAZANIN, J.  
Principles and systems for utilization of solar energy in heating and preparation of hot water  
15 p0255 A77-30257
- PEARSON, G. P.  
Rechargeability studies of ambient temperature lithium/sulfur batteries  
16 p0447 A77-48729
- Study of silica scaling from geothermal brines [PB-262890/7]  
15 p0357 A77-23626
- PEARSON, J. D.  
International energy evaluation system  
15 p0319 A77-38216
- PEARSON, R. K.  
Reactions in the ZnSe thermochemical cycle for hydrogen production  
14 p0178 A77-24854
- Recent developments in the engineering and chemistry of the ZnSe thermochemical hydrogen cycle  
16 p0457 A77-48815
- PEARSON, R. O.  
Planning and design of additional East Mesa Geothermal Test Facilities. Phase 1B, Volume 2: Procurement package [SAM/1140-1/2-VOL-2]  
16 p0558 A77-33657
- PEARSON, V.  
Design of the Montana Magneto-hydrodynamics Component Development and Integration Facility  
16 p0458 A77-48822
- PEATFIELD, C. R.  
Photovoltaic applications for the National Park Service  
16 p0460 A77-48837
- PEAVY, B. A.  
Transpiration heat transfer in thermal energy storage devices [PB-267281/4]  
16 p0554 A77-33616
- PEDESEN, M. J.  
Synthesis and analysis of jet fuel from shale oil and coal syncrudes [NASA-CR-135112]  
13 p0103 A77-12240
- PEDESO, R. L.  
The Stirling engine - Engineering considerations in view of future needs  
13 p0041 A77-12842
- PERLLE, E.  
Internalizing social costs in power plant siting: Some examples for coal and nuclear plants in the United States [CONF-761103-16]  
15 p0386 A77-26816
- PEER, E. L.  
Trends in refinery capacity and utilization: Petroleum refineries in the United States; foreign refinery exporting centers [PB-256966/3]  
13 p0132 A77-15524
- PEERENBOOM, J. P.  
Survey of nuclear fuel cycle economics: 1970 - 1985 [ORNL-TN-5703]  
16 p0561 A77-33968
- PEFLEY, R. K.  
Computer predicted compression ratio effects on NOx emissions from a methanol fueled SI engine  
16 p0444 A77-48706
- PELLOW, H. C.  
Design considerations for capillary heat pipes at cryogenic temperatures [ORNL-MT-28]  
15 p0361 A77-24430
- PELOPSKY, A. H.  
Synthetic fuels processing: Comparative economics; Proceedings of the Symposium, New York, N.Y., April 4-9, 1976  
15 p0300 A77-36326
- PELOPSKY, A. L.  
Direct production of methane and benzene from coal  
15 p0306 A77-36766
- PELSTER, J. H.  
Analysis of state solar energy options [PB-254730/5]  
13 p0091 A77-10688
- PEMBROOK, J. D.  
A multigas analyzer for automobile exhausts  
15 p0297 A77-36026
- PENATI, S.  
Pumped-storage electric power generating plants  
14 p0166 A77-23374
- PENDERGRASS, J. H.  
Heat transfer problems associated with laser fusion  
13 p0068 A77-18441
- PENDLETON, R. L.  
Evaluating a solar energy concentrator  
13 p0047 A77-13505
- PENN, L. S.  
Fiber composite program for flywheel applications [UCRL-50033-76-1]  
15 p0345 A77-22643
- PENNER, F. S.  
Energy analysis handbook. CAC document 214 [COO-2865-1]  
15 p0372 A77-25635
- PENNER, S. S.  
Introductory remarks on space observations of long-term climatic changes produced by escalating energy use [IAF PAPER A-77-01]  
16 p0507 A77-51508
- PENNISI, A.  
Thin film solar acceptors  
13 p0072 A77-19053
- PENNY, M. H.  
Development status and environmental hazards of several candidate advanced energy systems  
16 p0452 A77-48776

- PEPPER, J.**  
Compressed air energy storage for electric utility load leveling  
16 p0458 A77-48825
- PERCHERON, A.**  
A new hydrogen storage electrode  
13 p0047 A77-13539
- PERELSHTEIN, B. KH.**  
Analysis of parameters and characteristics of a bypass turbojet engine operating in a cycle with stepwise heat removal  
13 p0063 A77-17765
- PERRI, G.**  
Contribution to the study of solar energy collectors - Selective plates and cells  
13 p0072 A77-19051  
Focusing collectors of solar radiation  
14 p0150 A77-21808  
Tradeoff between selectivity and concentration in the collection of solar energy  
14 p0150 A77-21810
- PERKINS, G. S.**  
Sun tracking solar energy collector  
[NASA-CASE-NFO-13921-1]  
15 p0363 N77-24590
- PERKINS, R. A.**  
Metal dusting corrosion in coal gasification environments  
15 p0337 A77-40042
- PERL, L. J.**  
Is nuclear energy economically viable  
13 p0045 A77-12933
- PERRIGO, L. D.**  
Ocean thermal energy conversion opportunities  
[BNWL-SA-5808]  
14 p0217 N77-18581  
OTEC annual report to the Division of Solar Energy for FY-1976 and the transition quarter  
[BNWL-2154]  
15 p0382 N77-26665
- PERRY, A. M.**  
Net energy from nuclear power  
[PB-254659/9]  
13 p0107 N77-12527  
IEA energy simulation model: A framework for long-range US energy analysis  
[ORAU-125]  
13 p0122 N77-14594
- PERRY, R. H.**  
Optimization of absorption air-conditioning for solar energy applications  
[NASA-CR-150176]  
14 p0210 N77-17560
- PERRY, J. E., JR.**  
The current technology for solar heating and cooling  
16 p0470 A77-48919
- PERRY, J., JR.**  
Methanol-air batteries  
[AD-A035942]  
15 p0375 N77-25675
- PESCHKA, W.**  
A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car  
15 p0279 A77-33378  
On the storage of hydrogen by use of cryo-adsorbents  
15 p0283 A77-33408  
A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car  
14 p0240 N77-21612  
On the storage of hydrogen by use of cryo-adsorbents  
14 p0245 N77-21646
- PESOCIN, V. E.**  
Evaporation of solution droplets in a high-temperature medium  
13 p0046 A77-13254  
Evaporation of a drop of solution in a high-temperature medium  
15 p0263 A77-31534
- PETER, J. N.**  
Effect of components on converters  
14 p0153 A77-21841
- PETERS, C. H. D.**  
Total energy systems  
13 p0006 A77-11042
- PETERS, N.**  
A feasibility study of bio-gas production in individual farms in Southwestern Ontario  
16 p0489 A77-49082
- PETERS, W.**  
Fundamentals of coal gasification  
15 p0308 A77-36809
- The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology  
16 p0505 A77-51156
- PETERS, W. A.**  
Basic studies of coal pyrolysis and hydrogasification  
[PB-254878/2]  
13 p0096 N77-11511
- PETERSEN, C. K.**  
Thermionic emission characteristics of seeded coal slags  
14 p0140 A77-21229  
Generator wall slag coating and material corrosion experiments  
15 p0427 A77-39542
- PETERSEN, E. E.**  
Chromatographic determination of adsorption and diffusion in a bidispersed porous solid  
[LBL-5273]  
16 p0532 N77-31269
- PETERSEN, G. W.**  
Interpretation of Pennsylvania agricultural land use from ERTS-1 data  
[E77-10111]  
14 p0215 N77-18525
- PETERSEN, E. R.**  
Characterization of substances in products effluents and wastes from synthetic fuel production tests  
[BNWL-2131]  
16 p0540 N77-31675
- PETERSON, A. A.**  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project  
[NASA-CR-149242]  
13 p0105 N77-12513
- PETERSON, C. L.**  
Thermochemical cycles utilizing sulfur for hydrogen production from water  
15 p0276 A77-33353
- PETERSON, J. H.**  
Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier  
[PB-266854/9]  
16 p0525 N77-30255
- PETERSON, J. R.**  
Coal fired combined cycle for electric power generation  
16 p0453 A77-48783
- PETERSON, P. L.**  
Recommendations for a US geothermal research plan, volume 1  
[PB-261566/4]  
15 p0346 N77-22640  
Recommendations for a US geothermal research plan, Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2]  
15 p0346 N77-22641  
Recommendations for a US geothermal research plan, Volume 2: Executive summary  
[PB-261568/0]  
15 p0346 N77-22642  
Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8]  
15 p0346 N77-22643
- PETERSON, R. B.**  
Solar energy - Promises and pitfalls  
[AIAA PAPER 77-1022]  
16 p0409 A77-41856
- PETERSON, R. E.**  
Improved black nickel coatings for flat plate solar collectors  
14 p0204 A77-29585
- PETIT, J.-P.**  
Induction devices - A new type of magnetohydrodynamic converter  
14 p0198 A77-28786
- PETRICK, H.**  
Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245]  
15 p0387 N77-26988
- PETRIX, W.**  
Extended cryogenic performance of Lobar Wick heat pipe/radiator  
13 p0119 N77-14379
- PETROCELLI, A. W.**  
The nickel-zinc battery - A viable alternative for vehicle powering  
14 p0160 A77-22894
- PETROV, B. N.**  
Automatic optimization of operating modes in thermionic electrical power generators  
[IAF PAPER 77-142]  
16 p0507 A77-51445

PETROV, V. G.  
Some results of MHD-laser investigation 15 p0328 A77-39549

PETIT, F. S.  
Oxidation-erosion of materials in high velocity hot gases 15 p0270 A77-32604

PETTY, S.  
Progress on the Mark VI long-duration MHD generator 14 p0141 A77-21237  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility 14 p0142 A77-21257  
Mark VI MHD generator studies 15 p0325 A77-39528  
Electrode phenomena in slagging MHD channels 15 p0330 A77-39561

PETTY, S. W.  
Progress in channel development for direct coal fired MHD 16 p0458 A77-48824

PETUKHOV, B. S.  
Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide 13 p0058 A77-16213  
Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361

PEUBE, J. L.  
Thermodynamic conversion systems as applied to solar energy 14 p0148 A77-21783  
Problems relating to heat storage 14 p0152 A77-21826

PFANNKUCHE, H. O.  
High-temperature energy storage in native rocks 16 p0492 A77-49104

PFENDER, E.  
Heat transfer - A review of 1975 literature 13 p0002 A77-10615

PFISTERER, F.  
Technology of large area Cu/x/S-CdS solar cells 14 p0149 A77-21798  
Investigation on the crystalline structure of Cu/x/S-CdS solar cells 14 p0149 A77-21803

PHARABOD, P.  
Interaction between the solar mirror field and the thermodynamic system of a turning solar power plant 14 p0151 A77-21824

PHARABOD, MR.  
Problems relating to heat storage 14 p0152 A77-21826

PHILIPS, A. E., III  
Static and wind-on tests of an upper-surface-blown jet-flap nozzle arrangement for use on the Quiet Clean Short-haul Experimental Engine (QCSEE) [NASA-TN-D-8476] 15 p0370 A77-25086

PHILIPS, P. L.  
Overview of the Imperial Valley environmental project [UCID-17067] 13 p0132 A77-15533

PHILIPP, H. D.  
Hydrogen cycle peak-shaving on the New York State Grid using fuel cells 14 p0199 A77-29094

PHILLIPS, A. M.  
Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045] 16 p0546 A77-32593

PHILLIPS, B. A.  
Absorption cycles for air-cooled solar air conditioning 14 p0168 A77-23447

PHILLIPS, C. B.  
Oxidation of methanol on agitated bed electrodes using non-metallic electrocatalysts 14 p0176 A77-24568

PHILLIPS, J.  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications 16 p0486 A77-49059

PHILLIPS, J. A.  
The magnetic energy storage system used in ZT-1 15 p0299 A77-36314

PHILLIPS, J. D.  
Assessment of a single-family residence solar heating system in a suburban development setting. Project Phoenix [PB-263192/7] 16 p0530 A77-30632

PHILLIPS, M. P.  
In-situ coal gasification: Status of technology and environment impact [PB-268576/6] 16 p0548 A77-32613

PHILLIPS, T. A.  
An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components [PB-267629/4] 16 p0531 A77-31046

PHILLIPS, W. F.  
Axial conduction in a flat-plate solar collector 13 p0068 A77-18447

PIACSKY, S. A.  
Geophysical fluid dynamics background for ocean thermal power plants [DSE/1005-1] 16 p0555 A77-33624

PIAN, C. C. P.  
Boundary-layer separation from the electrode wall of an MHD generator 13 p0048 A77-13711  
Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls [NASA-TN-D-8396] 14 p0207 A77-16445

PIANKO, M.  
Aviation transportation and atmospheric pollution [ONERA, TP NO. 1977-79] 15 p0321 A77-38533

PICARD, J.-J.  
Energy conservation in the investment policies of French firms. I - Formulation of the problem 15 p0324 A77-39504

PICHE, B.  
An experimental 200 kW vertical axis wind turbine for the Magdalen Islands 13 p0044 A77-12874

PICHEL, P. W.  
A new 10,000-hp gas turbine engine for industrial service [ASME PAPER 77-GT-4] 14 p0197 A77-28524

PICK, M. A.  
Physical metallurgy of FeTi-hydride and its behavior in a hydrogen storage container 14 p0242 A77-21620

PICKETT, D. F.  
Space battery technology for the 1980s [AIAA PAPER 77-482] 14 p0172 A77-23902

PICKLESIMER, E. A.  
Cryogenic temperature control by means of energy storage materials [AIAA PAPER 77-763] 15 p0312 A77-37273  
Heat pumps: Substitutes for outmoded fossil-fueled systems [PB-266218/7] 16 p0524 A77-29638

PIERCE, B. L.  
Thermal energy storage 16 p0461 A77-48841

PIERCE, W. T.  
Efficient, low cost, concentrating solar collectors 16 p0423 A77-44486

PIERCE, R.  
User needs vs. technical demands, or the art of tradeoff in making a good, inexpensive solar home 16 p0495 A77-49134

PIERRE, B.  
Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling [ASME PAPER 77-GT-2] 14 p0197 A77-28522

PIERRE, D. A.  
Dynamic modeling and control of magnetohydrodynamic/steam electrical power generating plants 15 p0332 A77-39572

PIERSON, E.  
Experimental two-phase liquid-metal magnetohydrodynamic generator program [AD-A035245] 15 p0387 A77-26988

PIERSON, E. S.  
Liquid-metal MHD - Cycle studies and generator experiments 13 p0034 A77-12785

- Liquid-metal MHD coupled to coal-fired fluidized-bed combustors  
14 p0143 A77-21269
- Initial generator tests with revised ambient-temperature liquid-metal MHD facility  
15 p0326 A77-39538
- Sodium-nitrogen liquid-metal MHD facility initial test results  
15 p0327 A77-39539
- Predicted and measured finite-width effects in linear induction machines  
16 p0413 A77-42628
- Finite length effects in linear induction machines with different iron contours  
16 p0413 A77-42629
- PIETSCH, J. A.  
The unitary heat pump industry - 25 years of progress  
16 p0408 A77-41822
- PIGNASTII, S. S.  
Experimental investigation of energy conversion efficiency during the interaction of a conducting-fluid piston with a magnetic field  
14 p0204 A77-29618
- PILAND, R.  
Space power stations - Space construction, transportation, and pre-development, space project requirements [TAP PAPER 77-64]  
16 p0506 A77-51415
- PILATI, D. A.  
Energy analysis handbook. CAC document 214 [COO-2865-1]  
15 p0372 N77-25635
- PILLSBURY, P. W.  
Recent tests of industrial gas turbine combustors fueled with simulated low heating value coal gas [ASME PAPER 76-WA/GT-3]  
14 p0185 A77-26459
- Advanced coal gasification system for electric power generation [FE-1514-176]  
13 p0088 N77-10653
- PINEAU, P.  
A petroleum substitute - Active CO2  
14 p0200 A77-29325
- PINES, R. S.  
The use of program GEOTHM to design and optimize geothermal power cycles  
13 p0031 A77-12758
- Multiparameter optimization studies on geothermal energy cycles  
16 p0456 A77-48804
- PINKHASIK, M. S.  
Study of the ionization of the additive in MHD installations  
13 p0002 A77-10424
- Measurement of the excess oxidant ratio in the combustion products of an MHD-generator  
14 p0136 A77-20107
- PINON, R.  
Characteristics of the concentrated solar flux produced by the FMSC prototype  
16 p0474 A77-48953
- PINTO, S.  
Energy storage in the form of latent heat  
14 p0157 A77-22350
- PIPER, J. E.  
Energy utilization index method for predicting building energy use. Volume 2: Proposed supplement to TB ENG 529 [AD-A040344]  
16 p0521 N77-29608
- PISONI, C.  
Study of thermal performance of solar heating systems with storage and auxiliary heaters  
16 p0417 A77-42957
- PISTOULET, B.  
Thermoelectric conversion of solar energy by means of refractory B14Si compounds  
14 p0154 A77-21848
- PITTINATO, G. P.  
Some material considerations involved in the application of solar energy to electric power generation  
13 p0049 A77-13739
- PITTMAN, P. P.  
New concepts in solar photovoltaic electric power systems design  
13 p0038 A77-12817
- Silicon solar photovoltaic power stations [AIAA 77-1021]  
16 p0404 A77-41563
- Residential application of photovoltaic energy systems  
16 p0497 A77-49155
- PIVROTTO, D. S.  
Electric utility companies and geothermal power  
13 p0031 A77-12759
- PIVOT, J.  
Improvement of the efficiency of M-S solar cells by interfacial modifications  
14 p0151 A77-21818
- PLANTE, E. B.  
Crystallization and vaporization studies on synthetic coal slag compositions  
14 p0140 A77-21228
- PLASS, H. J., JR.  
A simplified equilibrium model of the U.S. energy-economic system and its use in comparing alternatives  
15 p0285 A77-33421
- A simplified equilibrium model of the US energy-economic system and its use in comparing alternatives  
14 p0247 N77-21662
- PLAVINSKII, A. I.  
Measurement of the excess oxidant ratio in the combustion products of an MHD-generator  
14 p0136 A77-20107
- PLETT, E. G.  
Coal particle integrity in high-temperature solvents, with and without agitation  
16 p0401 A77-41317
- PLOTNIKOV, I. IA.  
A simple physical model of a magnetohydrodynamic generator  
16 p0443 A77-48570
- PLOYART, R.  
Procedure for characterizing flat plate solar collectors  
13 p0073 A77-19056
- Testing of collectors on the solar simulator - Fitting to the theoretical model and extrapolation  
14 p0149 A77-21794
- Effect of the geometric arrangement of a collector array on technico-economic performance of a fixed-power utilization system  
14 p0149 A77-21795
- PLUNKETT, J. D.  
Design of the Montana Magnetohydrodynamics Component Development and Integration Facility  
16 p0458 A77-48822
- POBER, R. L.  
Test results on the spinel electrode module in laboratory and simulated MHD environment  
14 p0140 A77-21227
- Design and performance of high temperature ceramic electrode modules  
15 p0327 A77-39543
- POBEREZHSKII, L. P.  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility  
14 p0142 A77-21257
- Processing of experimental data with the U-25 facility with the aid of a data measuring system  
15 p0269 A77-32521
- POCARD, R. P.  
Turbines and turbogenerators for solar power plants with thermodynamic cycles  
14 p0152 A77-21828
- POCOBELLO, M. A.  
Design of a current technology electric vehicle  
16 p0446 A77-48727
- PODESSER, E.  
Solar heating projects at the Institute for Environmental Research  
13 p0079 A77-19119
- PODIO, A. L.  
Proceedings of Second Geopressed Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3]  
14 p0249 N77-21678
- PODIHOV, V. B.  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method [BLL-M-25448-(5828.4P)]  
13 p0112 N77-13235

- POE, G. G.  
Evaluation of molten scrubbing for fine particulate control  
[PB-266092/6] 16 p0517 N77-28642
- POHL, D.  
Studies of electric vehicle drives, illustrated by the example of an urban estate car 14 p0160 A77-22893
- POHL, J. G.  
Design and performance of an air collector for industrial crop dehydration 16 p0488 A77-49078  
Three-dimensional tracking solar energy concentrator and method for making same  
[NASA-CASE-NPO-13736-1] 16 p0545 N77-32583
- POLASEK, F.  
Heat pipes for the temperature range from 200 to 600 C 13 p0119 N77-14381  
Heat pipes with a non-condensable gas and their application in nuclear apparatus and instruments 13 p0120 N77-14387
- POLGAR, S.  
Use of solar generators in Africa for broadcasting equipment 15 p0256 A77-30320
- POLIAKOV, A. F.  
Heat transfer and resistance in rotating pipes /Review/ 16 p0402 A77-41361
- POLIAKOV, O. L.  
Acoustic properties of subsonic MHD channel 13 p0054 A77-15668
- POLIKOVSKII, M. V.  
Determination of the non-equilibrium MHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor 15 p0326 A77-39537
- POLLACK, F. H.  
Epitaxial silicon technology for low-cost solar cells  
[PB-262396/5] 15 p0374 N77-25663
- POLLACK, H. H.  
The flow of heat from the earth's interior 16 p0408 A77-41800
- POLLARD, W. G.  
The long-range prospects for solar energy 13 p0017 A77-12237  
The long-range prospects for solar-derived fuels 13 p0017 A77-12240
- POLLOCK, S.  
Energy R&D modeling for budgetary decisions 15 p0319 A77-38218
- POLSTER, M. R.  
Self-starting, intrinsically controlled Stirling engine 13 p0041 A77-12844
- POLUEKTOV, V. P.  
Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765  
Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421
- PONEROY, B. D.  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles  
[NASA-CR-134949-VOL-2-PT-2] 15 p0379 N77-26633  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results  
[NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment  
[NASA-CR-134949-VOL-3] 15 p0380 N77-26636
- PONDER, T. C., JR.  
Status of sulfur dioxide removal systems for the electric utility industry 16 p0504 A77-51144
- PONDER, W. H.  
SO2 control technologies - Commercial availabilities and economics 14 p0191 A77-27279
- Proceedings: Symposium on Flue Gas Desulfurization, volume 1  
[PB-255317/0] 13 p0110 N77-12597
- PONPON, J. P.  
Open-circuit voltage of silicon solar cells 14 p0151 A77-21820
- PONS, R. L.  
A solar/Stirling total energy system 16 p0481 A77-49021
- PONTIER, L.  
A surface thermal anomaly in the region of Chaudes-Aigues /France/ detected on aerial thermographs 13 p0014 A77-11591
- PONTIN, G. W. W.  
The 'wind-wall' - An integrated wind/solar system 16 p0410 A77-42075
- POOLE, D. R.  
Thermal energy storage by the sulfuric acid-water system 16 p0492 A77-49108
- POPE, W. L.  
Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804
- POPEL, O. S.  
Limiting values of the energy generated by pulsed MHD-converters 15 p0316 A77-37929
- POPOV, A. G.  
Procedure for calculating thermocompressor thermodynamical parameters 16 p0442 A77-48519
- POPOV, A. N.  
Study of the properties of heat pipes with liquid-metal heat-transfer agents in low-temperature regimes 13 p0046 A77-13243
- POPPELWELL, J.  
The long term stability of magnetic liquids for energy conversion devices 14 p0177 A77-24573
- POPPELWELL, J. H.  
Corrosion prevention in aluminum solar systems 15 p0270 A77-32602
- POPYRIN, L. S.  
All-round technical and economic investigations of open-cycle industrial MHD generator channels and superconducting magnet systems 14 p0142 A77-21266
- PORTER, D. F.  
User experience with the Enfield car 16 p0159 A77-22884
- PORTER, J. H.  
The use of commercially available absorption units on solar-powered cooling systems 14 p0168 A77-23445
- PORTER, J. T., II  
Water splitting - A progress report 15 p0274 A77-33330
- POSEY, F. A.  
Corrosivity of geothermal brines  
[ORNL-TM-5688] 15 p0359 N77-24265
- POST, R. E.  
Evaluation of potassium titanate as a component of alkaline fuel cell matrices  
[NASA-TN-D-8341] 13 p0094 N77-11175
- POTIBON, A.  
Optimization of the sizing of a solar power plant in order to obtain a minimal kWh cost 14 p0154 A77-21845
- POTTER, R. P.  
Energy and Physics: General Conference of the European Physical Society  
[AD-A026962] 13 p0131 N77-15511
- POTTER, R. H.  
Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- POULOS, M. E.  
Georgia Tech 400 Kwth solar thermal test facility 16 p0498 A77-49158
- POULSON, R. E.  
Characteristics of synthetic crude from crude shale oil produced by in situ combustion retorting 14 p0169 A77-23552  
Production of synthetic crude from crude shale oil produced by in situ combustion retorting 14 p0169 A77-23557

- POUZO, J. O.**  
A possible correlation of the neutron yield to the electromechanic work in Fother-type plasma focus devices  
13 p0061 A77-17017
- POVOLOTSKII, L. B.**  
Heat tests with a GT-35 gas turbine as an element of steam-gas facility with a high-pressure steam generator  
14 p0136 A77-20109
- POVOLOTSKII, L. V.**  
Investigating the starting modes of the GT-35 gas turbine plant  
16 p0426 A77-45324
- POWELL, C.**  
The migma high energy advanced fuel direct conversion fusion power plant  
13 p0035 A77-12794  
Advanced fuel fusion experimentation with Migmacells II and III - Orbit diagnostics and lifetime measurements  
16 p0436 A77-47362
- POWELL, C. W.**  
Fusion products detection system in Migmacell II  
16 p0436 A77-47363
- POWELL, J.**  
Technical and economic aspects of potential US district heating systems  
[BNL-21287] 14 p0232 N77-20594  
Technical and economic feasibility of US district heating systems using waste heat from fusion reactors  
[BNL-50516] 14 p0232 N77-20606
- POWELL, J. E.**  
Closed Brayton cycle using hydrogen as a work fluid  
[BNL-20899] 13 p0085 N77-10542
- POWELL, P. H.**  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- POWERS, J. H.**  
The Alcoa 655 selective surface for aluminum  
16 p0487 A77-49063
- POWERS, T. R.**  
The oxidant formation potential of emissions from catalyst-equipped vehicles  
15 p0333 A77-39596
- PRABHAKAR, R.**  
Optimization of automotive engine fuel economy and emissions  
15 p0320 A77-38373
- PRAIRIE, R. R.**  
Distribution of direct and total solar radiation availabilities for the USA  
16 p0471 A77-48926
- PRATHER, J.**  
Mechanisms of coal particle dissolution  
13 p0059 A77-16475
- PRATS, M.**  
Soluble-salt processes for in-situ recovery of hydrocarbons from oil shale  
16 p0441 A77-48472
- PRATT, R. E.**  
The potential for transit as an energy saving option  
[PB-263687/9] 15 p0359 N77-24019
- PRATT, W. P.**  
Mineral resources: Potentials and problems  
[USGS-CIRC-698] 16 p0544 N77-32563
- PREBLE, D. H.**  
Geothermal flux through palagonitized tephra, Surtsey, Iceland - The Surtsey temperature-data-relay experiment via Landsat-1  
13 p0048 A77-13648
- PRENGLE, H. W., JR.**  
Operational chemical storage cycles for utilization of solar energy to produce heat or electric power  
14 p0158 A77-22646
- PRESS, W. H.**  
Theoretical maximum for energy from direct and diffuse sunlight  
13 p0064 A77-17845
- PRESTON, G. T.**  
Resource recovery and flash pyrolysis of municipal refuse  
15 p0313 A77-37657
- PREUSS, R. D.**  
Potential aerodynamic analysis of horizontal-axis windmills  
[AIAA JAPR 77-132] 14 p0135 A77-19848  
Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills  
16 p0467 A77-48896
- PREYSS, A. E.**  
Hypersonic technology-approach to an expanded program  
13 p0051 A77-14597
- PRICE, D. R.**  
Bioconversion of agricultural wastes for pollution control and energy conservation  
[TID-27164] 15 p0383 N77-26675
- PRICE, J. H.**  
ERDA/NASA-MSFC solar heating and cooling development and demonstration program  
16 p0525 N77-30274
- PRICE, J. P.**  
Sources of energy data for Illinois  
[PB-262562/2] 15 p0350 N77-22686
- PRIGNORE, D.**  
Design and field test of a steam powered downhole geothermal pump  
16 p0456 A77-48806
- PRINCE, B. E.**  
Survey of nuclear fuel cycle economics: 1970 - 1985  
[ORNL-TM-5703] 16 p0561 N77-33968
- PRINCE, W. B.**  
Photovoltaic systems  
15 p0288 A77-34112
- PRITCHETT, J. W.**  
On pressure-work, viscous dissipation and the energy balance relation for geothermal reservoirs  
16 p0505 A77-51256  
Geohydrological environmental effects of geothermal power production, phase 2A  
[PB-261687/8] 15 p0347 N77-22653  
Computer simulation of geothermal reservoirs  
[PB-265104/0] 15 p0395 N77-27564
- PRIVSENTSEV, V. V.**  
Operation peculiarities of low temperature heat pipes with crimped capillary structure  
13 p0119 N77-14380  
Investigations of nonsteady-state processes at cryogenic heat pipe operation  
13 p0119 N77-14384
- PROBERT, S. D.**  
Thermal accumulators  
15 p0264 A77-31673  
Energy management  
15 p0304 A77-36424
- PROBSTEN, R. F.**  
Water requirements for an integrated SNG plant and mine operation  
13 p0060 A77-16651  
Water requirements for steam-electric power generation and synthetic fuel plants in the western United States  
[PB-268067/7] 16 p0540 N77-31667
- PROCHAZKA, R.**  
Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer  
[BLL-SMRE-TRANS-6562-(8313.4)] 15 p0371 N77-25485
- PROCTOR, D.**  
Solar energy for the Australian food processing industry  
14 p0181 A77-25900
- PROKIPIUS, P. R.**  
Experimental evaluation of a breadboard heat and product-water removal system for a space-power fuel cell designed with static water removal and evaporative cooling  
[NASA-TN-D-8485] 15 p0363 N77-24592
- PRONO, J. K.**  
Energy and technology review  
[UCRL-52000-76-8] 15 p0345 N77-22627
- PSCHUNDEE, W.**  
Low-cost solar cells based on large-area unconventional silicon  
15 p0258 A77-30730
- PSHENICHNOV, N. N.**  
All-round technical and economic investigations of open-cycle industrial MHD generator channels and superconducting magnet systems  
14 p0142 A77-21266

- PUCHLIK, K. P.  
Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California [UCRL-52180] 16 p0536 N77-31628
- PUCKETT, G. L.  
Small scale tests on control methods for some liquefied natural gas hazards [AD-A033522] 15 p0341 N77-22293
- PUDLIK, W.  
The minimum combustion gas recirculation ratio for fuel gas conversion in a MHD cycle 14 p0157 A77-22552
- PUESCHEL, R. F.  
Aerosol formation during coal combustion - Condensation of sulfates and chlorides on flyash 13 p0054 A77-15778  
Atmospheric ice nuclei - No detectable effects from a coal-fired powerplant plume 13 p0054 A77-15780  
Solar radiation atmospheric transmission research, phase 1 [PB-266010/8] 16 p0518 N77-28689
- PUGH, K. B.  
Quantitative studies on marine biodegradation of oil. III - Comparison of different crude oil residues and effects of sea water source 16 p0425 A77-44675
- PULFREY, D. L.  
A minority carrier MIS solar cell 15 p0288 A77-33799
- PURCHARD, W. F. B.  
Superconducting magnets for an MHD test facility and base load power plant 14 p0144 A77-21379  
Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet 14 p0144 A77-21391  
Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet [LA-UR-76-1809] 14 p0235 N77-21325
- PUNWANI, D. V.  
Hydrogen production by the steam-iron process 13 p0023 A77-12688
- PURCELL, A. R.  
Energy and environmental impacts of materials alternatives - An assessment of quantitative understanding 13 p0070 A77-18738
- PURCELL, D. D.  
Development of signal processing algorithms for ultrasonic detection of coal seam interfaces [NASA-CR-150024] 13 p0085 N77-10610
- PURCELL, J. R.  
Superconducting induction coil for a doublet Tokamak experimental fusion power reactor 14 p0144 A77-21376
- PURCELL, W. L.  
ENFORM: An energy information system [BNWL-2195] 16 p0542 N77-32016
- PURI, J. S.  
Design and performance studies on a solar room heater 15 p0255 A77-30314
- PUSCH, G.  
Tertiary oil production process 14 p0196 A77-28520
- PUSTOGAROV, A. V.  
A 2-MW electric arc generator with porous cooling of the interelectrode insert 13 p0049 A77-13831
- PUTHAM, A. A.  
Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks [PB-262789/1] 15 p0371 N77-25551
- PYE, J. W.  
UK, T5 ion engine thrust vector control considerations [AIAA PAPER 76-1064] 13 p0045 A77-13030
- QUADE, R. W.  
Hydrogen production from coal using a nuclear heat source 15 p0275 A77-33339  
Hydrogen production from coal using a nuclear heat source 14 p0238 N77-21568
- QUAGGIOTTI, V.  
Pressure ratio optimization criteria in aircraft turbojet-engines design 13 p0062 A77-17258
- QUARTERO, C. B.  
Design of a large span-distributed load flying-wing cargo airplane [NASA-TM-X-74031] 15 p0353 N77-23089
- QUAST, A.  
Liquid hydrogen as propellant for commercial aircraft [DGLR PAPER 76-188] 13 p0059 A77-16534
- QUICKENDEN, T. I.  
The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583
- QUIGLEY, S. W.  
Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 N77-20616
- QUINCY, B. A.  
Remote sensing of an underground coal-burn cavity with a wide-band induction system 13 p0007 A77-11050
- QUINN, B.  
The consumer's cost of electricity from windmills 13 p0043 A77-12866
- QUINN, G. H.  
Helicopter offshore operations 16 p0421 A77-44437
- QURESHI, A. S.  
Design guidelines for energy conserving systems [PB-268989/1] 16 p0559 N77-33670
- QVALE, E. B.  
Seasonal storage of thermal energy in water in the underground 13 p0028 A77-12734

## R

- RAAB, B.  
The nuclear spinner for Satcom applications 13 p0041 A77-12838  
Nuclear-powered Hysat spacecraft: Comparative design study [ERDA-SNS-3063-8] 13 p0094 N77-11108
- RABE, D. C.  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser 15 p0326 A77-39532
- RABINOVICH, E. S.  
State of the art of controlled fusion 14 p0194 A77-27722
- RABL, A.  
Ideal concentrators for finite sources and restricted exit angles 13 p0003 A77-10835  
Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812  
Optical and thermal properties of Compound Parabolic Concentrators 14 p0157 A77-22641  
Development of compound parabolic concentrators for solar thermal applications [ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516  
Collector with cusplike compound parabolic concentrator and selective absorber 16 p0474 A77-48955  
Optical and thermal design considerations for ideal light collectors 16 p0474 A77-48956  
Salt requirement and stability of solar ponds 16 p0482 A77-49027  
Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications 16 p0483 A77-49031  
Prisms with total internal reflection as solar reflectors 16 p0488 A77-49071  
Prisms with total internal reflection as solar reflectors [ANL-SOL-76-04] 15 p0345 N77-22629

## Q

- BACCAR, P. M.**  
Epitaxial silicon technology for low-cost solar cells  
[PB-262396/5] 15 p0374 N77-25663
- BACKOV, P.**  
Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet  
14 p0144 A77-21391  
Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet  
[LA-08-76-1809] 14 p0235 N77-21325
- BADD, P. J.**  
Metal dusting corrosion in coal gasification environments  
15 p0337 A77-40042
- BADENACHNER, O.**  
Experience with a one stage variable geometry axial turbine  
15 p0340 N77-22143
- BADICE, P. C., JR.**  
Siting of wind driven apparatus  
13 p0043 A77-12865
- BADMER, B. J.**  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations  
[PB-261910/4] 15 p0350 N77-22688  
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations  
[PB-267937/1] 16 p0554 N77-33619
- BADTKER, M. L.**  
Energy resources alternatives competition  
[COO-2698-1] 14 p0224 N77-19635
- BAETZ, J. E.**  
Collector field optimization for a solar thermal electric power plant  
13 p0038 A77-12811  
Collector field design for a central receiver solar thermal power plant  
16 p0484 A77-49039
- BAGGINI, E. C.**  
Methods in environmental sampling for radionuclides  
[UCRL-77722] 13 p0091 N77-10697
- BAHILLY, W. P.**  
Hardened solar photovoltaics  
[AIAA PAPER 77-484] 14 p0172 A77-23904
- BAIKER, W. H.**  
An optimization study of a low thermal potential power system  
[AD-A031709] 15 p0348 N77-22666
- BAILEY, J. W.**  
A possible saturation criterion for wind energy extraction  
14 p0165 A77-23359
- BAITBY, G. D.**  
Studies on methods of reducing heat losses from flat plate solar collectors  
[COO-2597-2] 15 p0395 N77-27554
- BAJAGOPAL, G.**  
Three dimensional current distribution in diagonal conducting wall channels  
15 p0329 A77-39556
- BAJAKUMAR, A.**  
Transfer function analysis of heat pipes  
13 p0119 N77-14385
- BAJVANSHI, A. K.**  
The effect of dropwise condensation on glass solar properties  
16 p0422 A77-44485
- BAKHMANOV, A.**  
Statistical investigation of the operational efficiency of solar and evaporative cooling devices in Turkmenian conditions  
15 p0286 A77-33435  
Statistical investigation into the effectiveness of solar- and evaporative-cooler operation under the conditions of Turkmenia  
16 p0427 A77-45548
- BALEY, J. E.**  
Pyrolysis of oil shale: The effects of thermal history on oil yield  
[UCRL-77831] 13 p0129 N77-15499
- BALL, E.**  
Energy and US agriculture. 1974 data base, volume 1. Part A: US series of energy tables. Part B: State series of energy tables  
[PB-264449/0] 15 p0395 N77-27562
- BALLIS, C. J.**  
A new mathematical model for Stirling cycle machines  
16 p0465 A77-48884
- A new ported constant volume external heat supply regenerative cycle**  
16 p0465 A77-48885
- RALPH, E. L.**  
Photovoltaic systems using sunlight concentration  
13 p0076 A77-19089  
Meeting electric power needs with photovoltaic power systems  
13 p0076 A77-19091
- RAMACHANDRAN, A.**  
Heat and mass transfer problems associated with alternative energy production  
14 p0176 A77-24216
- RAMAIN, P.**  
Equivalence of electricity and fuels - Contributing elements to a critical discussion  
15 p0263 A77-31573
- RAMAKUMAR, R.**  
Wind driven field modulated generator systems  
13 p0044 A77-12869  
Wind-electric conversion utilizing field modulated generator systems  
16 p0489 A77-49087  
An assessment of hydrogen as a means to store solar energy  
16 p0492 A77-49107  
Technical and socio-economic aspects of solar energy and rural development in developing countries  
16 p0494 A77-49128  
Development and adaptation of field modulated generator systems for wind energy applications  
[PB-263604/1] 15 p0357 N77-23625
- RAMET, H. J., JR.**  
Workshop on Geothermal Reservoir Engineering  
[PB-261319/8] 14 p0251 N77-21709
- RANSEY, J. W.**  
Heat transfer - A review of 1975 literature  
13 p0002 A77-10615  
Experimental evaluation of a cylindrical parabolic solar collector  
[ASME PAPER 76-WA/HT-13] 14 p0186 A77-26473
- RANSEY, W. J.**  
US energy flow in 1976  
[UCID-17443] 16 p0557 N77-33639
- RANSHAW, R. S.**  
Element rating and coupling harmonics in a superconductive energy transfer system  
16 p0411 A77-42164
- RAND, R. C.**  
Applications of new systems to urban transportation  
14 p0137 A77-20392
- RANGI, R. S.**  
Recent Canadian activities in wind power  
16 p0470 A77-48916
- RANKEN, W. A.**  
The potential of the heat pipe in coal gasification processes  
13 p0031 A77-12763  
Ceramic heat pipe heat exchangers  
[LA-6514-MS] 15 p0361 N77-24431
- RANKIN, D. O.**  
Energy technologies for the west: What impact could energy technology development have on the quality of life  
[TID-27428] 16 p0538 N77-31645
- RANKIN, K.**  
The structure of building specifications  
[PB-257581/9] 13 p0132 N77-15524
- RANSONE, R. K.**  
The competitive market for commercial VSTOL  
[AIAA 77-573] 15 p0290 A77-34933
- RAO, B. M. L.**  
Ambient temperature electric vehicle batteries based on lithium and titanium disulfide  
13 p0025 A77-12706
- RAO, D. B.**  
Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems  
15 p0337 A77-40028  
Some studies on a solid state sulfur probe for coal gasification systems  
[NASA-TN-78428] 16 p0534 N77-31605
- RAO, D. B.**  
Potential application of radial splitter diffuser to shrouded wind turbines  
14 p0199 A77-29071



- RAO, D. P.  
Solar water pump for lift irrigation  
13 p0019 A77-12406
- RAO, G. V.  
Results of some geothermal studies in Singhbhum thrust belt, India  
13 p0013 A77-11499
- RAO, K. R.  
International Conference on Thermoelectric Energy Conversion, University of Texas, Arlington, Tex., September 1-3, 1976, Proceedings  
16 p0500 A77-49753
- RAO, K. S.  
Solar water pump for lift irrigation  
13 p0019 A77-12406
- RAO, H. U.  
Results of some geothermal studies in Singhbhum thrust belt, India  
13 p0013 A77-11499
- RAPOSA, F. L.  
Modeling of electric drive systems for KEW /flywheel/ vehicles  
14 p0200 A77-29469
- RAPPAPORT, A.  
Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3]  
13 p0110 N77-12576
- RAPPAPORT, M. L.  
Resistance of superconducting-normal metal-superconducting sandwiches [LBL-5473]  
15 p0341 N77-22393
- RASHCHEPKIN, A. P.  
Calculation of the electric fields and currents in a plasma flowing in a spatially periodic magnetic field  
15 p0295 A77-35798
- RASHIDI, M.  
An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions  
15 p0283 A77-33406
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel  
15 p0283 A77-33407
- An examination of the stirred reactor as a tool for the determination of rate constants of the H<sub>2</sub>-O<sub>2</sub> combustion reactions  
14 p0245 N77-21644
- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel  
14 p0245 N77-21645
- RASOR, W. S.  
Status of research on advanced thermionic converters  
16 p0466 A77-48889
- RASSAKAKIN, B. M.  
An analytical study of the maximal heat-carrying capacity of heat pipes  
16 p0411 A77-42260
- RASTEGAEV, B. I.  
Study of the electrical characteristics of the boundary layer on the metal surfaces in the channels of an open cycle MHD generator  
13 p0054 A77-15666
- RASULOV, D. T.  
Photoelectric and electrical properties of n-SiC - n-GaS heterojunctions  
16 p0442 A77-48518
- RATAJCZAK, A. F.  
Photovoltaic-powered refrigerator experiment at Isle Royale National Park [NASA-TM-73703]  
15 p0390 N77-27497
- Solar cell shingle [NASA-CASE-LEW-12587-1]  
16 p0534 N77-31601
- RATH, J.  
Past experience - Basis for future advanced power systems for communications satellites [IAF PAPER 77-22]  
16 p0506 A77-51390
- RATH, L. K.  
Operation of the Westinghouse Coal Gasification Process Development Unit  
13 p0023 A77-12689
- Development of the Westinghouse coal gasification process - A status report  
16 p0446 A77-48722
- RATNALINGAM, R.  
Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia  
14 p0153 A77-21840
- RATZEL, A. C.  
Optimal material selection for flat-plate solar energy collectors utilizing commercially available materials  
13 p0068 A77-18444
- RAU, H.  
Solar technology: Solar energy in practical application /3rd revised and enlarged edition/  
15 p0271 A77-33113
- RAUCH, J. S.  
Steady-state and transient performance limitations of the ABKLA Solar absorption cooling system  
16 p0478 A77-48987
- RAUFER, R. K.  
The air quality and economic implications of supplementary control systems in Illinois [PB-255699/1]  
13 p0101 N77-11588
- RAUH, R. D.  
Rechargeability studies of ambient temperature lithium/sulfur batteries  
16 p0447 A77-48729
- RAUSCHENBACH, H. S.  
Solar cell array design handbook, volume 1 [NASA-CR-149364]  
13 p0118 N77-14193
- RAUSSEB, G. C.  
Air pollution and the siting of fossil fuel power plants [ANL-76-XX-14]  
15 p0386 N77-26708
- RAVI, K. V.  
The silicon ribbon solar cell  
13 p0076 A77-19083
- EBG growth of silicon ribbon for solar cells  
16 p0485 A77-49051
- RAVITSKY, C.  
A summary of the DARPA energy and materials shortages programs, fiscal years 1972-1976 [AD-A036021]  
15 p0375 N77-25677
- RAY, D. C.  
Improved, inexpensive solar collectors for agricultural requirements  
16 p0488 A77-49077
- RAY, P. S.  
Advanced fuel nuclear reaction feasibility using laser compression. II  
16 p0435 A77-47359
- RAYMER, D. P.  
Wind tunnel investigation of devices to reduce bus aerodynamic drag [AIAA PAPER 77-307]  
13 p0066 A77-18232
- RAYNARD, A. E.  
Battery-flywheel hybrid electric power system for near term application. Volume 2: System design [UCID-17098-VOL-2]  
14 p0228 N77-20443
- REA, S. M.  
Large area Czochralski silicon for solar cells  
16 p0486 A77-49054
- READ, P. J.  
North American views of energy choices for the future particularly fluid fuels synthesized from coal  
15 p0307 A77-36807
- READER, K. E.  
Test program for transmitter experiment package and heat pipe system for the communications technology satellite [NASA-TM-X-3455]  
13 p0095 N77-11268
- REALS, F.  
Wetting and surface properties of refrigerants to be used in heat pipes  
13 p0119 N77-14386
- REALS, F. B.  
Investigation into the use of large-scale total-energy systems in mild and warm climates  
16 p0401 A77-41318
- REBER, S. A.  
Comparative economics for the Arthur D. Little extractive coking process  
13 p0022 A77-12684
- The relative advantages of coal conversion routes for electric power generation  
15 p0300 A77-36330
- Comparative economics for the Arthur D. Little extractive coking process  
15 p0301 A77-36340

- BECK, R. J.  
Composites for large space structures  
[IAP PAPER 77-65] 16 p0507 A77-51416
- BECKMAN, W. A.  
Parametric study of critical fuel costs for solar heating in North America  
[CONF-760842-12] 15 p0392 N77-27533
- REDDING, T. E.  
Solar power satellite concepts and potential related space systems 16 p0463 A77-48870
- Study of Lyndon B. Johnson Space Center utility systems  
[NASA-TM-58196] 15 p0388 N77-27161
- REDDY, G. B.  
Environmental aspects of coal conversion plant siting and cost of pollution control 14 p0192 A77-27293
- REECE, W. S.  
The impact of the energy crisis on the demand for fuel efficiency - The case of general aviation 16 p0410 A77-42038
- REED, C. K.  
Report of the subcommittee on energy-related atomic and molecular science  
[PB-264052/2] 15 p0375 N77-25673
- REED, J. C.  
Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157
- REED, J. J.  
Analysis of the technical and cost feasibility of solar and/or wind energy systems for Coast Guard public quarters  
[AD-A028332] 14 p0209 N77-16460
- REED, K.  
Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812
- Development of compound parabolic concentrators for solar thermal applications  
[ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516
- Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications 16 p0483 A77-49031
- REED, K. A.  
Instrumentation for measuring direct and diffuse insolation in testing thermal collectors  
[CONF-760832-23] 15 p0394 N77-27545
- REED, R. P.  
Branched thermocouple circuits in underground coal gasification experiments  
[SAND-75-5910] 13 p0130 N77-15504
- REED, R. R.  
Development of the fluidized-bed carbon-burnup cell 16 p0454 A77-48789
- REED, S. A.  
Waste heat vs conventional systems for greenhouse environmental control: An economic assessment  
[ORNL-TM-5069] 13 p0088 N77-10656
- REED, T. B.  
Electrochemical power and hydrogen generation from high temperature electrolytic cells 13 p0025 A77-12709
- Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory  
[PB-262980/6] 15 p0356 N77-23619
- REEVES, B. B.  
Measurements of Sc I gf-values 13 p0058 A77-16270
- REHACK, L.  
Ultimate consumption of fuel and energy in the nonindustrial sector 15 p0334 A77-39668
- REIBER, B.  
Environmental protection measuring technique. Sensor for automatic continuous emission control of gases  
[BNFT-PB-T-76-03] 14 p0209 N77-16467
- REICHENBACH, H. E.  
DoD energy R and D. Part 2: Military fuel operations. Performance and R and D implications  
[AD-A042272] 16 p0554 N77-33617
- REICHEL, D. E.  
Balanced program plan. Volume 4: Coal conversion  
[ORNL-5123-VOL-4] 14 p0216 N77-18566
- REID, H. S.  
Precision insolation measurement under field conditions 14 p0219 N77-19113
- REID, R. C.  
The importation of liquefied natural gas 14 p0194 A77-27607
- REID, R. L.  
The solar fan - Solar induced draft air conditioning system 16 p0478 A77-48988
- Economics of solar heating with homeowner-type financing 16 p0501 A77-50210
- REIDER, R.  
Hydrogen safety problems 15 p0283 A77-33402
- Hydrogen safety problems 14 p0245 N77-21640
- REIF, R. B.  
Destator test program evaluation  
[AD-A034260] 15 p0360 N77-24410
- REIGEL, F. O.  
Electron concentration measurements in combustion MHD flows by submillimeter laser interferometry 16 p0425 A77-44821
- REILLY, J. J.  
Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777
- Titanium alloy hydrides - Their properties and applications 15 p0280 A77-33385
- Hydrogen absorption in Ti3Al 16 p0506 A77-51372
- Hydrogen for energy storage: A progress report of technical developments and possible applications  
[BNL-20931] 13 p0094 N77-11201
- Metal hydrides as hydrogen storage media and their applications  
[BNL-21648] 14 p0231 N77-20589
- Hydrogen storage, water electrolysis and fuel cells for electric energy storage  
[BNL-21498] 15 p0344 N77-22620
- REINHOLD, R.  
Solar energy for process heat 16 p0481 A77-49020
- REINHOLD, R.  
Energy savings by application of knowledge of building physics. I - Wall permeability and its significance for the atmospheric conditions in the building interior, the design and the thermal characteristics of windows, problems concerning the permeability of the joints 15 p0261 A77-31373
- Energy savings obtained by applying the findings of construction physics. II 16 p0441 A77-48259
- REINER, T.  
Regional economic impacts of nuclear power plants  
[BNL-50562] 16 p0540 N77-31676
- REINHARDT, A.  
On the production of town gas from off-gases of the chemical processing industry 14 p0164 A77-23099
- REINHARDT, T. E.  
Photon energy storage in organic materials: The case of linked anthracenes  
[AD-A039702] 16 p0535 N77-31615
- REINHOLD, F.  
Design of the 4-215 D.A. automotive Stirling engine  
[SAE PAPER 770082] 16 p0424 A77-44560
- REINKENHOF, J.  
The storage of energy in future energy supply systems  
[DGLR PAPER 76-182] 13 p0059 A77-16533
- REISER, R.  
International energy demand model - Twenty OECD country models 15 p0318 A77-38215
- REISHAW, A. W.  
Energy model data base program  
[BNL-21545] 14 p0250 N77-21687
- REISSER, J. H.  
Hydrodynamics and compression of a laser irradiated target 14 p0146 A77-21745

- REISTER, D. B.  
 Net energy from nuclear power [PB-254C59/9] 13 p0107 N77-12527  
 IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125] 13 p0122 N77-14594
- REITAN, D. K.  
 Superflywheel energy storage and nonsynchronous AC/DC/AC electric transmission supplements power system operation 13 p0002 A77-10638
- REITZ, A. W., JR.  
 An Otto for the automobile. II 15 p0273 A77-33302  
 Running out of steam. III 15 p0310 A77-36984
- RENNER, D. S.  
 Assessing low sulfur coal resources in Montana and Wyoming 13 p0058 A77-16374
- RENNERBECK, K.  
 Prefabricated houses with an indoor swimming pool heated by a heat pump 16 p0421 A77-44448
- REPPUCCI, G. M.  
 Advanced photovoltaic power systems [AIAA PAPER 77-506] 14 p0173 A77-23923
- REUTER, R. C.  
 Engineering development status of the Darrieus wind turbine 14 p0166 A77-23365
- REUTER, R. C., JR.  
 Sandia vertical-axis wind turbine project [SAND-76-0581] 16 p0521 N77-29613
- REX, D.  
 Solar cell equipment with concentrating mirrors and radiator surfaces 15 p0324 A77-39494
- REYES, R.  
 The aqueous homogeneous reactor as a source of hydrogen and of process heat 15 p0274 A77-33329
- REYNOLDS, G. I.  
 Energy research for physicists 13 p0054 A77-15350
- REYNOLDS, J. S.  
 The atypical Mathew solar house at Coos Bay, Oregon 16 p0405 A77-41576
- REYNOLDS, S. L.  
 Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization [PB-254166/2] 13 p0101 N77-11581
- REYNOLDS, T. W.  
 A preliminary assessment of the feasibility of deriving liquid and gaseous fuels from grown and waste organics 13 p0021 A77-12673  
 Thermal stability of some aircraft turbine fuels derived from oil shale and coal [NASA-TM-X-3551] 15 p0370 N77-25345
- RHINEHART, B. L.  
 Development status - Binary Rankine cycle waste heat recovery system 16 p0459 A77-48828
- RHINER, W.  
 Status of research on advanced thermionic converters 16 p0466 A77-48889
- RHODEWIZER, R.  
 Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet 14 p0144 A77-21391  
 Ultra high-current superconducting cables for a 2.2-tesla, 300-kilojoule energy storage magnet [LA-UR-76-1809] 14 p0235 N77-21325
- RIABIKOV, S. V.  
 Some questions concerning the creation of a solar thermionic converter system 15 p0315 A77-37765  
 Some problems involved in the development of a solar thermionic power plant 16 p0436 A77-47421
- RIAZ, H.  
 Solar flux density distributions on central tower receivers 15 p0256 A77-30318  
 Large-scale thermal storage in rock - Construction, utilization, and economics 16 p0451 A77-48769
- Solar flux density distributions on central tower receivers 16 p0484 A77-49038
- High-temperature energy storage in native rocks 16 p0492 A77-49104
- RIBESSE, J.  
 A combined cycle with a partial-oxidation reactor 13 p0062 A77-17534
- RIBOULET, M.  
 Efficiency of photovoltaic cells employing Schottky diodes 14 p0151 A77-21815  
 Testing and fabrication of solar absorbers for the D5A satellite [CNES-NT-37] 13 p0111 N77-13110
- RICE, C. G.  
 Development of cumulative noise measure for the prediction of general annoyance in an average population 15 p0320 A77-38497
- RICE, J. L.  
 Internal heat transfer experiments in a simulated OTEC evaporator tube [APL/JRU/AEO-76-066] 16 p0521 N77-29611
- RICE, L. F.  
 Pressure drawdown and buildup analyses in geothermal reservoirs 13 p0030 A77-12753  
 Geohydrological environmental effects of geothermal power production, phase 2A [PB-261687/8] 15 p0347 N77-22653
- RICE, R. R.  
 Geohydrological environmental effects of geothermal power production, phase 2A [PB-261687/8] 15 p0347 N77-22653
- RICHARDS, A. F.  
 Energy from the oceans - Requirements and capabilities 15 p0272 A77-33141
- RICHARDS, T. R.  
 Dynamic blade loading in the ERDA/NASA 100 kW and 200 kW wind turbines [NASA-TM-73711] 16 p0528 N77-30599
- RICHARDSON, E. L.  
 Perspective on energy policy [PB-261736/3] 15 p0348 N77-22674
- RICHMOND, C. R.  
 Balanced program plan. Volume 4: Coal conversion [ORNL-5123-VOL-4] 14 p0216 N77-18566
- RICHTER, E.  
 Desulfurization of flue gases with iron(III) oxide on porous carrier material - Theoretical and experimental investigation concerning the modelling of semicontinuous solid bed reactors with gas-solid reactions 13 p0080 A77-19184  
 Flywheel module for electric vehicle regenerative braking 16 p0447 A77-48728
- RICHTER, G.  
 Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems 13 p0064 A77-18019
- RICHTER, E.  
 Thermal energy storage demonstration unit for Vuilleumier cryogenic cooler [AD-A040895] 16 p0553 N77-33613
- RICHTMYER, T.  
 Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program [PB-257770/8] 14 p0208 N77-16452
- RICHTMYER, T. E.  
 Initial test results for a solar-cooled townhouse in the mid-Atlantic region 14 p0170 A77-23655
- RIDDELL, F. R.  
 DoD energy R and D. Part 2: Military fuel operations. Performance and R and D implications [AD-A042272] 16 p0554 N77-33617
- RIDDIFORD, C. L.  
 A new Chrome Black selective absorbing surface 16 p0406 A77-41585
- RIDGWAY, S. L.  
 Underground storage of off-peak power 13 p0027 A77-12728

- RIEBOLD, G.  
Application of solar energy in the  
high-temperature range  
13 p0063 A77-17636
- RIEMANN, C. F.  
Proceedings of Second Geopressed Geothermal  
Energy Conference. Volume 4: Surface  
technology and resource utilization  
[CONF-760222-P4]  
14 p0248 N77-21675
- RIEMER, D. E.  
University of Utah direct contact Geothermal Power  
Project report. A computer program for  
determining the thermodynamic properties of water  
[UTEC-WF-76-171]  
15 p0380 N77-26642
- RIETJENS, L. H. TH.  
Experimental fluctuation analysis in a noble gas  
MHD generator  
15 p0326 A77-39535
- RIGO, H.  
ERDA/Lewis research center photovoltaic systems  
test facility  
[NASA-TN-X-73641]  
15 p0343 N77-22609
- RINDLE, J. A.  
Composite fiber flywheel for energy storage  
15 p0306 A77-36672  
Composite fiber flywheel for energy storage  
[UCRL-78085]  
14 p0225 N77-19645  
Fiber composite program for flywheel applications  
[UCRL-50033-76-1]  
15 p0345 N77-22633
- RINGIER, R. J.  
Impact of advanced fuel fusion on electric power  
transmission  
16 p0436 A77-47361
- RIOS-CASTELLON, L.  
Preliminary analysis of electric generation  
utilizing geopressed geothermal fluids  
13 p0030 A77-12752
- RIPPEY, J. O.  
Preliminary design study of a baseline Mius  
[NASA-TN-X-58193]  
16 p0561 N77-34050
- RITCHIE, I. T.  
Applications of thin graded-index films to solar  
absorbers  
15 p0260 A77-31244
- RITTELHANN, P. R.  
Residential application of photovoltaic energy  
systems  
16 p0497 A77-49155
- RITNER, R. S.  
Improved theory of the silicon p-n junction solar  
cell  
14 p0166 A77-23364
- RIVERO, J. R.  
The PUROX System  
15 p0315 A77-37671
- ROA, G.  
Grain drying in stationary bins with solar heated  
air  
13 p0019 A77-12411
- ROACH, F.  
Solar energy: Policy and Prospects  
[PB-267986/8]  
16 p0554 N77-33620
- ROAN, V. F.  
The design and development of a hybrid-electric  
urban transit vehicle  
14 p0159 A77-22876
- ROBBINS, H.  
Solar conversion efficiency of pressure sintered  
cadmium selenide liquid junction cells  
15 p0320 A77-38367
- ROBBINS, R. L.  
Law and solar energy systems - Legal impediments  
and inducements to solar energy systems  
13 p0018 A77-12401
- ROBERT, J. L.  
Thermoelectric conversion of solar energy by means  
of refractory Bi4Si compounds  
14 p0154 A77-21848
- ROBERTS, A. S., JR.  
A comparison of GaAs and Si hybrid solar power  
systems  
16 p0406 A77-41584  
Analysis of GaAs and Si solar energy hybrid systems  
[NASA-CR-2800]  
14 p0229 N77-20564
- ROBERTS, C. C., JR.  
Cooling arrays of circuit cards using heat pipes  
and forced air diffusers  
13 p0031 A77-12766
- A zero g variable conductance heat pipe using  
bubble pump injection  
[AIAA PAP87-77-752]  
15 p0311 A77-37265
- ROBERTS, F. S.  
Energy: Mathematics and models; Proceedings of the  
Conference, Alta, Utah, July 7-11, 1975  
13 p0008 A77-11233
- ROBERTS, G. O.  
Geophysical fluid dynamics background for ocean  
thermal power plants  
[DSE/1005-1]  
16 p0555 N77-33624
- ROBERTS, R. L.  
Preliminary design study of a baseline Mius  
[NASA-TN-X-58193]  
16 p0561 N77-34050
- ROBERTS, J. L.  
An energy management guidance scheme applicable to  
the interim upper stage  
[AD-A034005]  
15 p0353 N77-23143
- ROBERTS, R. V.  
Fusion power  
13 p0005 A77-11034
- ROBERTS, R.  
Processing on high efficiency solar collector  
coatings  
16 p0526 N77-30286
- ROBERTS, R. L.  
Aluminum or copper substrate panel for selective  
absorption of solar energy and the method of  
producing said panel  
[NASA-CASE-NPS-23518-1]  
16 p0535 N77-31610  
Stainless steel panel for selective absorption of  
solar energy and the method of producing said  
panel  
[NASA-CASE-NPS-23518-2]  
16 p0535 N77-31611
- ROBERTS, R. C.  
Energy analysis in modelling  
13 p0007 A77-11047
- ROBERTSON, A. S.  
Energy Conservation Alternatives Study (ECAS),  
phase 2: Volume 2: Advanced energy conversion  
systems, - conceptual designs. Part 1:  
Analytical approach  
[NASA-CR-134949-VOL-2-PT-1]  
15 p0379 N77-26632
- ROBERTSON, D. E.  
Mercury emissions from geothermal power plants  
15 p0289 A77-34428
- ROBERTSON, E. E.  
Perpetually renewable biomass prospects - A  
comparison of U.S. and Canadian ecosystem  
carrying capacities vs needs  
16 p0489 A77-49084
- ROBERTSON, J. A. L.  
Research and development for Canadian nuclear power  
[AECL-5314]  
13 p0097 N77-11533
- ROBERTSON, J. E.  
Assembly and testing of a 1.8 by 3.7 meter Fresnel  
lens solar concentrator  
[NASA-CR-150300]  
15 p0378 N77-26610
- ROBERTSON, R. C.  
Mius systems analysis: Initial comparisons of  
modular-sized integrated utility systems and  
conventional systems  
[ORNL-HUD-Mius-6]  
14 p0249 N77-21684
- ROBIN, A. E.  
Hydrogen production from coal liquefaction residues  
[PB-261734/8]  
15 p0350 N77-22687  
Hydrogen production from coal liquefaction residues  
[EPRI-AP-233]  
16 p0551 N77-33374
- ROBINSON, D. A.  
Solar power array for the concentration of energy.  
Task 2: Modifications to a specular photometer  
[COO-2699-3]  
13 p0098 N77-11538
- ROBINSON, D. C.  
Minor radius compression experiments  
16 p0407 A77-41683
- ROBINSON, J. W.  
Energy LA: Tackling the crisis; Proceedings of the  
Second Greater Los Angeles Area Energy  
Symposium, Los Angeles, Calif., May 19, 1976  
14 p0182 A77-26076
- ROBINSON, P.  
Epitaxial silicon technology for low-cost solar  
cells  
[PB-262396/5]  
15 p0374 N77-25663
- ROBINSON, S. L.  
Hydrogen compatibility of structural materials for  
energy storage and transmission applications  
[SAND-76-8255]  
15 p0395 N77-27533

- ROBISON, M. G.  
Synthesis and analysis of jet fuel from shale oil  
and coal syncrudes  
[NASA-CR-135112] 13 p0103 N77-12230
- ROBLES, T. C.  
A heat capacitor for MHD electric power generation  
systems 15 p0331 A77-39571
- ROBSON, A. E.  
A multi-megajoule inertial-inductive energy  
storage system 15 p0299 A77-36292
- ROBSON, B.  
A review of gasification for power generation 15 p0322 A77-38790
- ROBSON, P. L.  
Steam station repowering - A near-term method of  
energy conservation 13 p0022 A77-12679
- Fuel gas environmental impact  
[PB-257134/7] 14 p0209 N77-16470
- ROCHA, E. P.  
Liquefied natural gas for California 14 p0183 A77-26083
- ROCHER, BR.  
Study of a heliostat system for a solar thermal  
converter with an energy of 10 MW 14 p0150 A77-21811
- RODEKORR, M.  
A derived demand model of energy demand in the  
transportation sector 15 p0319 A77-38217
- RODGERS, B. E.  
A laboratory evaluation of precoat filtration  
parameters for the solvent refined coal process 13 p0059 A77-16474
- An experimental and analytical investigation of a  
solar water heater  
[ASME PAPER 76-WA/SOL-22] 14 p0190 A77-26527
- RODGERS, G.  
Energy information activities at the FEA  
[PB-253562/5] 13 p0099 N77-11553
- RODGERS, M. E.  
In-channel observations on coal slag 14 p0139 A77-21222
- Comparison of measurements and predictions of the  
fluid mechanics and thermal behavior of MHD  
channel slag layers 15 p0330 A77-39564
- RODGERS, R. J.  
Gaseous fuel reactors for power systems 16 p0468 A77-48906
- ROEBER, R.  
Plastics in systems of solar technology - A survey 14 p0197 A77-28677
- Plastics in systems of solar technology 15 p0336 A77-39979
- ROELS, O. A.  
Marine pastures: A by-product of large (100  
megawatt or larger) floating ocean-thermal power  
plants  
[COO-2581-3] 16 p0555 N77-33625
- ROEMER, T. S.  
Water splitting - A progress report 15 p0274 A77-33330
- An assessment of the materials needs for a Kr-85  
fuel capsule 16 p0462 A77-48855
- ROESSLER, W. G.  
Research plan for achieving reduced automotive  
energy consumption  
[PB-255929/2] 13 p0121 N77-14495
- ROFFMAN, A.  
Environmental considerations of converting  
fossil-fueled power plants from oil or natural  
gas to coal 14 p0181 A77-26043
- ROFFMAN, H.  
Environmental considerations of converting  
fossil-fueled power plants from oil or natural  
gas to coal 14 p0181 A77-26043
- ROGER, J. A.  
Improvement of the efficiency of M-S solar cells  
by interfacial modifications 14 p0151 A77-21818
- The use of solar cells as energy supply for a  
pumping system 14 p0155 A77-21854
- ROGERS, D. A.  
Coal fired non-equilibrium closed cycle MHD power  
plant system since ECAS 15 p0332 A77-39576
- ROGERS, P. E.  
Coal particle integrity in high-temperature  
solvents, with and without agitation 16 p0401 A77-41317
- ROGERS, R. H.  
Oxygen accumulation and electrolyte loss in nickel  
hydrogen cells 14 p0195 A77-28157
- ROGERS, J. D.  
Superconducting magnetic energy storage  
[LA-UR-76-2047] 15 p0397 N77-27933
- ROGERS, L. J.  
4.8-megawatt fuel cell module demonstrator 16 p0447 A77-48738
- ROGERS, S. E.  
Evaluation of the potential environmental effects  
of wind energy system development,  
[ERDA/NSF-07378/75/1] 15 p0382 N77-26663
- ROGERS, V. C.  
Radiolytic hydrogen production from a laser fusion  
system 13 p0035 A77-12795
- ROGULEV, A. I.  
Isothermal surface in a radiation field 13 p0014 A77-11918
- ROGUS, C. A.  
Modern incineration - A proven way for recovery of  
energy and metals 16 p0434 A77-47220
- ROHR, F. J.  
Electrode-connecting material as a central  
component of high-temperature fuel cells. II -  
Investigation of selected high-conductivity  
mixed oxides 13 p0056 A77-15817
- ROHRBACH, C.  
Experimental and analytical research on the  
aerodynamics of wind turbines  
[COO-2615-76-T-1] 14 p0223 N77-19613
- ROHRBACH, B. G.  
Thermal alteration of young kerogen in relation to  
petroleum genesis 13 p0053 A77-15044
- Thermal alteration experiments on organic matter  
from recent marine sediments in relation to  
petroleum genesis 15 p0298 A77-36254
- ROHRMANN, C. A.  
Large scale hydrogen production utilizing carbon  
in renewable resources 15 p0321 A77-38527
- Recommendations for a US geothermal research plan,  
volume 1 15 p0346 N77-22640
- Recommendations for a US geothermal research plan.  
Volume 1: Appendix A: Glossary. Appendix B:  
Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641
- Recommendations for a US geothermal research plan.  
Volume 2: Executive summary 15 p0346 N77-22642
- Recommendations for a geothermal utilization plan,  
Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- ROLFO, A.  
Flight results of a cryogenic cooler designed for  
Meteosat  
[IAF PAPER 76-210] 13 p0003 A77-10942
- ROLINSKI, R. J.  
Energy and the environment; Proceedings of the  
Third National Conference, Oxford, Ohio,  
September 29-October 1, 1975 15 p0291 A77-35146
- ROLLAND, P.-A.  
New modes of operation for avalanche diodes -  
Frequency multiplication and upconversion 13 p0049 A77-14261
- ROLSTEN, R. P.  
Energy and the environment; Proceedings of the  
Third National Conference, Oxford, Ohio,  
September 29-October 1, 1975 15 p0291 A77-35146
- ROLSTON, J. A.  
Fiber glass super flywheels 14 p0157 A77-22143

- ROMERO, N.  
Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells 13 p0069 A77-18517
- ROMERO, A. F.  
10 MW solar thermal electric power plant design for solar day operation 14 p0153 A77-21842
- ROH, H.  
Metal hydrides of improved heat transfer characteristics 13 p0033 A77-12775
- RONCATO, J. P.  
Thermodynamics of thermochemical water decomposition processes 14 p0238 A77-21574
- RONCATO, J.-P.  
Thermochemical production of hydrogen - Myth or reality 15 p0270 A77-32593
- ROPER, A.  
Study of exitance distribution along the walls of a cellular low-loss cell in the case of a base surface with arbitrary emission indicatrix 13 p0069 A77-18495  
Antiloss cell structures - Coupling with a selective surface 14 p0148 A77-21790  
Antiloss cellular structures - The effect of the material cutoff wavelength 14 p0148 A77-21791
- ROSA, R. J.  
Voltage consolidation and control circuits for multiple-electrode MHD generators 14 p0141 A77-21252  
Part-load performance and voltage-current characteristics of a base load MHD generator 15 p0332 A77-39573
- ROSE, D. J.  
Nuclear power - Compared to what 13 p0017 A77-12234  
The prospect for fusion 13 p0058 A77-16357
- ROSE, I. B.  
CCMS solar energy pilot study solar heating and cooling systems in buildings [UMD-4908-5] 13 p0088 A77-10657
- ROSE, P. H.  
The laser solenoid - An alternate use of lasers in fusion power 14 p0198 A77-28962
- ROSE, R. K.  
Development of the High Seasonal Performance Factor Gas Heat Pump 16 p0448 A77-48744  
Development status - Binary Rankine cycle waste heat recovery system 16 p0459 A77-48828
- ROSELL, F. E., JR.  
Test and evaluation of the Navy half-watt RTG 13 p0042 A77-12853
- ROSEN, H.  
Raman scattering and the characterisation of atmospheric aerosol particles 15 p0262 A77-31487
- ROSENBERG, R.  
A simplified method in flight test techniques for the determination of the range performance of jet aircraft 13 p0060 A77-16600
- ROSENFELD, A.  
Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552
- ROSENQVIST, W. K. G.  
The development of a 150 kW /200 HP/ Stirling engine for medium duty automotive application - A status report [SAE PAPER 770081] 16 p0424 A77-44559
- ROSENSTEIN, H. J.  
Identifying and analyzing methods for reducing the energy consumption of helicopters [NASA-CR-144953A] 15 p0388 A77-27104
- ROSENTHAL, B.  
The auto option 15 p0310 A77-36983
- ROSENWASSER, S.  
Design considerations for a noncircular Tokamak demonstration plant [GA-A-14074] 15 p0351 A77-22968
- ROSS, B.  
Environmental research needs for coal conversion and combustion technologies [PB-262159/7] 15 p0347 A77-22659
- ROSS, F. F.  
A 1977 approach to sulfur oxide emissions [ASME PAPER 77-JPGC-PWE-1] 16 p0508 A77-51621
- ROSS, J. S. H.  
Superconducting a.c. generators - Progress on the design of a 1300 MW, 3000 rev/min generator 14 p0144 A77-21386
- ROSS, M. H.  
The potential for fuel conservation 14 p0178 A77-24960
- ROSS, P. W., JR.  
Thermal efficiency of solid electrolyte fuel cells with mixed conduction 16 p0500 A77-50199
- ROSS, R. G., JR.  
Design considerations of solar arrays for terrestrial applications 16 p0485 A77-49053
- ROSS, R. S.  
Thin films in energy systems 15 p0306 A77-36673
- ROSSEN, W.  
Benefits of hydrogen production research 13 p0032 A77-12768
- ROSSING, B. R.  
The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility 15 p0327 A77-39540  
The evaluation of electrode materials for slag coated MHD channels 15 p0328 A77-39545
- ROSSOPF, J.  
Control of waste and water pollution from power plant flue gas cleaning systems [PB-259211/1] 14 p0227 A77-19953
- ROSSOW, H. E.  
Solar energy subsystems employing isothermal heat sink materials [PB-258738/4] 14 p0233 A77-20616
- ROTH, J. R.  
Optimization of confinement in a toroidal plasma subject to strong radial electric fields 16 p0438 A77-47958
- ROTH, R. S.  
Crystallization and vaporization studies on synthetic coal slag compositions 14 p0140 A77-21228
- ROTHEBERG, J. E.  
Energy consumption and conservation in the United States 13 p0005 A77-11028
- ROTHMAN, A. J.  
Pyrolysis of oil shale: The effects of thermal history on oil yield [UCRL-77831] 13 p0129 A77-15499
- ROTHMAN, E. A.  
Materials and processing approaches to cost competitive wind turbine rotor blades 14 p0157 A77-22144
- ROTHWART, A.  
Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell 14 p0149 A77-21797  
Design analysis of the thin-film CdS-Cu<sub>2</sub>S solar cell 15 p0258 A77-30721  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications 16 p0486 A77-49059  
Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell [PB-252409/8] 13 p0089 A77-10672
- ROTHKOLBER, P.  
High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591
- ROTTIER, G.  
Lumiducts for Ecopolis 13 p0079 A77-19116
- ROTTY, R. H.  
Net energy from nuclear power [PB-254059/9] 13 p0107 A77-12527

- ROUKLOVE, P.  
Tests and evaluation of multihundred watt  
thermoelectric generators at JPL  
16 p0462 A77-48854
- ROUKLOVE, P. G.  
Test and evaluation of the Navy half-watt RTG  
13 p0042 A77-12853
- ROUSE, L. E.  
Review - Silicon solar cells for terrestrial  
applications  
14 p0178 A77-25085
- ROUSE, M.  
The 1975 automotive characteristics data base  
[PB-262015/1]  
15 p0354 N77-23507
- ROUSSEAU, J.  
Solar-powered Rankine-cycle heat pump system  
13 p0036 A77-12800
- ROWLETT, B. H.  
Battery-flywheel hybrid electric power system for  
near term application. Volume 2: System design  
[UCID-17098-VOL-2]  
14 p0228 N77-20443
- ROWLEY, J. C.  
Geothermal energy development  
13 p0064 A77-17801  
New turbodrill for geothermal drilling  
16 p0456 A77-48810
- ROYERE, C.  
The French CNRS 1000 kW solar furnace -  
Description, performance characteristics,  
present utilization, and perspectives  
15 p0262 A77-31473  
1 MWh solar cavity steam generator solar test  
program  
16 p0461 A77-48846
- ROZELL, D. K.  
Project Sunshower - San Jose State University  
dormitory retrofit to solar-assisted water heating  
16 p0479 A77-48996
- ROZHDESTVENSKII, I. B.  
Thermodynamic analysis of the formation of the  
oxides of nitrogen and sulfur in fuel combustion  
products  
15 p0269 A77-32506
- ROZHNIKOV, I. A.  
Study of the characteristics of convective heat  
transfer in cylindrical solar energy receivers  
by solving the conjugate problem of heat exchange  
15 p0316 A77-37771  
Investigation of convective heat-transfer  
characteristics in cylindrical solar receivers  
by solution of the conjugate heat-exchange problem  
16 p0437 A77-47427
- RUBANOVICH, I. M.  
Effect of solar-radiation density and angular size  
of radiation source on efficiency of solar power  
plants  
14 p0143 A77-21312  
Some questions concerning the creation of a solar  
thermionic converter system  
15 p0315 A77-37765  
Some problems involved in the development of a  
solar thermionic power plant  
16 p0436 A77-47421
- RUBERTO, R. G.  
Characterization of synthetic liquid fuels  
14 p0169 A77-23554
- RUBIN, B.  
Methanol engine: A transportation strategy for  
the post-petroleum era  
[UCRL-52041]  
14 p0219 N77-19469  
Energy and resource planning group  
[UCRL-50029-76]  
15 p0372 N77-25634
- RUBIN, L.  
A derived demand model of energy demand in the  
transportation sector  
15 p0319 A77-38217
- RUBINSTEIN, I.  
The origin of the oil sand bitumens of Alberta - A  
chemical and a microbiological simulation study  
16 p0438 A77-47765
- RUCHELMAN, L. I.  
Design of municipal services in support of high  
rise office buildings  
[PB-262532/5]  
15 p0370 N77-25021
- RUDD, D. F.  
Discovery of reaction sequences for thermochemical  
water splitting  
15 p0275 A77-33343
- Strategy of pollution control  
16 p0400 A77-40673
- Discovery of reaction sequences for thermochemical  
water splitting  
[AD-A029959]  
14 p0228 N77-20191
- Discovery of reaction sequences for thermochemical  
water splitting  
14 p0238 N77-21575
- RUDERMAN, R.  
Analysis of the California energy industry  
[LBL-5928]  
16 p0557 N77-33640
- RUDINS, G.  
The second joint test of a U.S. electrode system  
in the U.S.S.R. U-02 facility  
15 p0327 A77-39540  
Superconducting magnet development for the MHD  
program  
15 p0331 A77-39569
- RUDMAN, P. S.  
Hydrogen vehicular fuel storage as a step in a  
water splitting cycle  
15 p0280 A77-33381  
Hydrogen absorption in Ti3Al  
16 p0506 A77-51372  
Hydrogen vehicular fuel storage as a step in a  
water splitting cycle  
14 p0242 N77-21615
- RUDOLF, S.  
Influence of bonding and filling agents on the  
activity of tungsten carbide hydrogen electrodes  
15 p0260 A77-31173
- RUEDEHAUER, F.  
Application of solar heat to buildings in Austria  
13 p0079 A77-19114
- RUEGG, R.  
Life-cycle costs and solar energy  
13 p0047 A77-13501
- RUETHER, J. A.  
Kinetics of heterogeneously catalyzed coal  
hydroliquefaction  
14 p0196 A77-28473
- RUFEN, F.  
Advanced thermionic converter development  
13 p0043 A77-12862  
Thermionic converter studies at Thermo Electron  
16 p0466 A77-48887
- RUHLA, C.  
Perspectives of geothermal energy in France  
16 p0399 A77-40512
- RUOSCH, E.  
Solar energy installation for the project 'Motto  
di Lena' in Minusio/Tessin  
16 p0441 A77-48257
- RUPE, J. E.  
New potentials for conventional aircraft when  
powered by hydrogen-enriched gasoline  
15 p0281 A77-33392  
New potentials for conventional aircraft when  
powered by hydrogen-enriched gasoline  
14 p0243 N77-21629
- RUPP, R.  
The solution of the garbage problem: New proposals  
for the utilization of refuse - Proposals and  
suggestions  
13 p0015 A77-12061
- RUPPE, H. O.  
Powersats - An economic assessment  
16 p0431 A77-46775
- RUPPEL, T. C.  
Kinetics of regeneration of spent seed from MHD  
power generation systems  
14 p0141 A77-21251
- RUSELL, J. L., JR.  
Development of a sulfur-iodine thermochemical  
water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- RUSH, R.  
Development of compound parabolic concentrators  
for solar-thermal electric and process heat  
applications  
13 p0038 A77-12812
- RUSSELL, J. L., JR.  
Water splitting - A progress report  
15 p0274 A77-33330  
Development status of the fixed mirror solar  
concentrator  
16 p0460 A77-48834

- RUSSELL, O. B.**  
Application of LANDSAT-2 data to the  
implementation and enforcement of the  
Pennsylvania Surface Mining Conservation and  
Reclamation Act  
[E77-100C7] 13 p0085 N77-10590
- RUSSO, F. A.**  
KIPS - Kilowatt Isotope Power System  
13 p0041 A77-12837
- RUSSO, G.**  
Transmission solar focusing collector  
15 p0334 A77-39671
- RUSTA, D.**  
Power source requirements of electric propulsion  
systems used for north-south stationkeeping of  
communication satellites  
13 p0040 A77-12833
- RUTBERG, P. G.**  
High-power systems with ac generators and inertial  
storage tanks for electrophysical devices  
15 p0261 A77-31426
- RUTKEVICH, I. M.**  
Effect of two-dimensional inhomogeneities on the  
properties of frayed MHD channels  
16 p0428 A77-46088
- RUTSCHER, A.**  
Status and outlook of controlled nuclear fusion  
14 p0163 A77-23095
- RUSSSEN, O.**  
Off-shore oil scenarios - Method and results  
13 p0018 A77-12282
- RUZIC, W. P.**  
Aerospace and HVACER: Spinoff '77 - Reaping the  
dividends  
16 p0427 A77-45918
- RYAN, J. W.**  
Long term energy alternatives for automotive  
propulsion. Synthetic fuel versus  
battery/electric system  
[PB-262512/7] 15 p0361 N77-24504
- Long term energy alternatives for automotive  
propulsion: Synthetic fuel versus  
battery/electric system  
[PB-262513/5] 15 p0361 N77-24505
- The hydrogen economy: A preliminary technology  
assessment  
[PB-266607/1] 16 p0512 N77-28329
- RYAN, R. A.**  
Santa Clara, California, community center,  
commercial solar demonstration legal  
alternatives, implications, and financing of  
solar heating and cooling by a municipal  
corporation  
[SAN/1083-76/1] 15 p0394 N77-27549
- RYASON, P. R.**  
Hydrogen quantum yields in the 360 nm photolysis  
of Eu<sup>2+</sup>/ solutions and their relationship to  
photochemical fuel formation  
16 p0501 A77-50203
- Solar photolysis of water  
[NASA-CASE-NFO-13675-1] 16 p0544 N77-32580
- RYBA, J. S.**  
Laboratory evaluation of solar power units for  
marine aids to navigation  
[AD-A034987] 15 p0375 N77-25672
- RYBIN, M.**  
The outlook for more efficient fuel utilization in  
generation of process heat  
15 p0294 A77-35400
- RYBKIN, B. I.**  
Operation peculiarities of low temperature heat  
pipes with crimped capillary structure  
13 p0119 N77-14380
- RYCROFT, R. W.**  
Our energy future: The role of research,  
development, and demonstration in reaching a  
national consensus on energy supply  
14 p0179 A77-25224
- Our energy future: The role of research,  
development, and demonstration in reaching a  
national consensus on energy supply  
[PB-263761/9] 15 p0367 N77-24635
- RYDBECK, V. A.**  
Electric vehicles - A major potential contribution  
to solution of U.S. energy problems  
16 p0420 A77-44060

- RYLANDER, H. G.**  
The design, fabrication and testing of a five  
megajoule monopolar motor-generation  
15 p0299 A77-36311
- RYLE, M.**  
Economics of alternative energy sources  
15 p0288 A77-33755
- RYAREV, P. P.**  
Contribution of the heat carried by solar  
radiation to the thermal balance of a room  
during the cold season and its effect on  
domestic fuel consumption  
13 p0063 A77-17558
- RYBEVSKII, V. M.**  
Optimization of the geometry of switching bases  
for thermoelements in thermoelectric generators  
13 p0052 A77-14951

## S

- SAAKAIDA, R. B.**  
Study of gasoline vapor emission controls at small  
bulk plants  
[PB-267096/6] 16 p0549 N77-32638
- SAASKI, R. W.**  
Two-phase working fluids for the temperature range  
100-350 C  
[AIAA PAPER 77-753] 15 p0312 A77-37266
- A structured surface for high performance  
evaporative heat transfer  
[AIAA PAPER 77-778] 15 p0312 A77-37283
- An investigation of condensation heat transfer in  
a closed tube containing a soluble  
noncondensable gas  
[NASA-CR-149095] 13 p0085 N77-10465
- SABBAGH, J. A.**  
Thermo-chemical production of hydrogen  
13 p0075 A77-19074
- SABEL, W.**  
Energy from wastes  
13 p0006 A77-11038
- SABER, A. J.**  
Annular-flow solar heater collector tubes  
[AIAA PAPER 77-190] 14 p0135 A77-19886
- SABRIE, J. L.**  
Research and development of cryoalternators for  
large-electrical power systems  
14 p0190 A77-26536
- SACADURA, J. P. O.**  
Characteristic equations of unconcentrated flat  
solar cell panels  
13 p0052 A77-14929
- SACARTO, D. M.**  
State policies for geothermal development.  
Uncovering a major resource  
[PB-261744/7] 14 p0252 N77-21728
- SADDY, M.**  
Solar powered steam generation  
16 p0459 A77-48832
- SADEN, S. E.**  
Methane production from solid waste  
16 p0434 A77-47218
- SADOVNIK, I.**  
Mark VI MHD generator studies  
15 p0325 A77-39528
- SAGATOV, E. S.**  
Thermoelectric power of pseudoternary solid  
solutions  
13 p0014 A77-11917
- SAGER, P. H., JR.**  
Characteristics of a first generation commercial  
fusion power plant  
[GA-A-13661] 13 p0093 N77-10891
- SAB, C. T.**  
Basic mechanisms governing solar-cell efficiency  
16 p0486 A77-49060
- SAB, C.-T.**  
Fundamental electronic mechanisms limiting the  
performance of solar cells  
15 p0257 A77-30710
- SABA, A. B.**  
National Solar Energy Convention, Jadavpur  
University, Calcutta, India, November  
29-December 1, 1976, Proceedings  
14 p0177 A77-24659
- SABA, H.**  
Matching of solar cells and performance of a solar  
battery  
15 p0256 A77-30316



- SAHAI, R.  
Development of an (AlGaAs-Ga As) graded band gap solar cell  
[NASA-CR-145161] 15 p0355 N77-23603
- SAIF-UL-BEHAN, H.  
Economic competitiveness of solar energy with conventional fuels and electricity 14 p0158 A77-22648
- SAINT JOSEPH, J. K. S.  
The uses of air photography /2nd edition/  
15 p0295 A77-35675
- SAINT LAURENT, R.  
Flywheel hybrid power trains. I - Component and drive selection. II - Numerical optimization and operation 16 p0438 A77-47968
- SAITOH, T.  
Fabrication and characterization of thin-film silicon solar cells on alumina ceramic 15 p0258 A77-30732
- SAITOV, N.  
Calculations on an optimized faceted solar concentrator 13 p0015 A77-11921
- SAKAI, I.  
Solar space heating and cooling with Bi-heat source heat pump and hot water supply system 14 p0158 A77-22643
- SAKAI, Y.  
High efficiency n-CdS/p-InP solar cells prepared by the close-spaced technique 14 p0156 A77-22081
- SAKE, I. A.  
Factors affecting the use of solar energy for cooling 13 p0078 A77-19108  
Optical performance of fixed zenith-moving azimuth paraboloid-cylindrical concentrator 16 p0417 A77-42955
- SAKURAI, T.  
Design and fabrication of solar concentrators 13 p0074 A77-19062
- SAKUTA, K.  
A terrestrial solar thermal electric power system - Development of basic model system 16 p0422 A77-44478  
Fundamental studies on heat storage of solar energy 16 p0423 A77-44490
- SALAMON, K.  
Traction batteries for existing and future electric road vehicles 14 p0159 A77-22878
- SALE, B.  
Reduction of atmospheric pollution due to the automobile and energy savings 14 p0162 A77-22948
- SALIEVA, R. B.  
Design principles for solar and wind power installations 13 p0015 A77-11922  
Optimization criteria for solar and wind power systems 13 p0015 A77-11923  
Basis for developing a solar energy inventory 14 p0179 A77-25360  
Composition method for constructing guaranteed-output curves of solar- and wind-power plants utilized jointly 14 p0201 A77-29534  
Experience in using bimodal distribution curves to evaluate the reliability of systems supplying energy from renewable sources 14 p0201 A77-29535  
Modeling algorithms and their implementation on a digital computer for calculating the capacity of storage cells at wind-power and solar energy installations 15 p0316 A77-37775  
Fundamentals of solar-energy survey development 16 p0409 A77-41910  
Simulation algorithms and their realization by digital computer for calculation of wind- and solar-plant storage-service capacity 16 p0437 A77-47431  
Experience in constructing a solar energy cadastral survey 16 p0443 A77-48525
- SALISBURY, J. D.  
Monitoring fluid flow by using high-frequency electromagnetic probing [OCEI-51979] 13 p0120 N77-14393
- SALLES, Y.  
Industrial development of silicon solar cells [NASA-TT-F-17139] 13 p0097 N77-11528
- SALBERG, G.  
New modes of operation for avalanche diodes - Frequency multiplication and upconversion 13 p0049 A77-14261
- SALMON, D. F.  
A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- SALT, R.  
Progress report on the performance of three Australian solar hot water systems [SES-8] 15 p0364 N77-24604
- SALVADOR, L. A.  
Operation of the Westinghouse Coal Gasification Process Development Unit 13 p0023 A77-12689  
Development of the Westinghouse coal gasification process - A status report 16 p0446 A77-48724  
Advanced coal gasification system for electric power generation [FE-1514-176] 13 p0088 N77-10653
- SALVESEN, K.  
Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations 16 p0428 A77-46250
- SALZANO, P. J.  
Hydrogen storage via iron-titanium for a 26 MW/e/ peaking electric plant 13 p0048 A77-13543  
International cooperation on development of hydrogen technologies 14 p0171 A77-23717  
On enthalpy management in small buildings 14 p0194 A77-27354  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 15 p0277 A77-33359  
Closed Brayton cycle using hydrogen as a work fluid [BNL-20899] 13 p0085 N77-10542  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods [BNL-20877] 13 p0087 N77-10648  
Hydrogen for energy storage: A progress report of technical developments and possible applications [BNL-20931] 13 p0094 A77-11201  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods 14 p0238 N77-21593  
Hydrogen storage, water electrolysis and fuel cells for electric energy storage [BNL-21498] 15 p0344 N77-24620  
Energy management in residential and small commercial buildings [BNL-50576] 15 p0392 N77-27511  
Hydrogen production and storage in utility systems [BNL-50590] 16 p0515 N77-28600
- SAMUELS, A. F.  
Improved negative electrodes for lithium/iron sulfide batteries 16 p0448 A77-48742
- SAMUELS, G.  
MIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems [ORNL-HUD-MIUS-6] 14 p0249 N77-21684
- SAMUILOV, E. V.  
Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products 15 p0269 A77-32506
- SAN MARTIN, R. L.  
Solar heating and cooling of a 25,500 square foot building 14 p0181 A77-26054

- The New Mexico Department of Agriculture solar heated and cooled building  
[ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515  
A solar heated and cooled office building 16 p0475 A77-48966
- SANBORN, G. A.  
CuInS<sub>2</sub> thin-film homojunction solar cells 16 p0399 A77-40567
- SANBORN, J. B.  
Regional land use and energy modeling [BNL-21809] 15 p0378 N77-26595
- SANCHEZ-SILVENCIO, F.  
Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters 15 p0320 A77-38330
- SANDBERG, J.  
Advanced fuel fusion experimentation with Migmacells II and III - Orbit diagnostics and lifetime measurements 16 p0436 A77-47362
- SANDNESS, G. A.  
Recommendations for a US geothermal research plan, volume 1 [PB-261566/4] 15 p0346 N77-22640  
Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets [PB-261567/2] 15 p0346 N77-22641  
Recommendations for a US geothermal research plan. Volume 2: Executive summary [PB-261568/0] 15 p0346 N77-22642  
Recommendations for a geothermal utilization plan, Volume 3 [PB-261569/8] 15 p0346 N77-22643
- SANDQUIST, G.  
On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs 16 p0454 A77-48796
- SANDQUIST, G. H.  
Radiolytic hydrogen production from a laser fusion system 13 p0035 A77-12795
- SANDECK, G. D.  
Metallurgical considerations in the production and use of FeTi alloys for hydrogen storage 13 p0033 A77-12777  
A new family of hydrogen storage alloys based on the system nickel-nickel-metal-calcium 16 p0457 A77-48817
- SANMARTIN, R. L.  
Total energy systems: Solar energy program [SAND-76-5758] 16 p0514 N77-28591
- SANTAMATO, E.  
Efficiency tests on a linear parabolic concentrator for medium and high temperatures 13 p0077 A77-19103  
Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes 14 p0164 A77-23297
- SANTOLERI, J. J.  
Energy recovery from low heating value industrial waste 15 p0292 A77-35160
- SANTOR, S. D.  
Pyrolysis of oil shale: The effects of thermal history on oil yield [UCRL-77831] 13 p0129 N77-15499
- SANTAL, S.  
An update of world geothermal energy development 15 p0286 A77-33524
- SARGENT, N. B.  
Results of baseline tests of the Lucas Limousine [NASA-TN-X-73609] 14 p0214 N77-17947
- SARKAR, S. K.  
Space solar power versus space communications [IAF PAPER A-77-65] 16 p0507 A77-51532
- SARKAROV, N. E.  
Influence of the spatial inhomogeneity of the field and amplifying medium on the energy characteristics of a gas laser 15 p0289 A77-34221
- SARKIS, L. A.  
Gas-fired heat pumps - An emerging technology 14 p0195 A77-27891
- SARNA, S. C.  
A fermentation process for converting plant materials into methane 13 p0121 N77-14583
- SARRADIN, J.  
A new hydrogen storage electrode 13 p0047 A77-13539
- SARTREY, T. S.  
Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance 13 p0020 A77-12657
- SARVER, G. L.  
Satellite communications for off-shore oil operations using WESTAR 13 p0053 A77-15130
- SASAKI, J. E.  
Recent Canadian activities in solar heating 16 p0469 A77-48915
- SATANOVSKII, V. R.  
Determination of the non-equilibrium NHD generator optimal parameters in a thermonuclear power station with 'Tokamak' type reactor 15 p0326 A77-39537
- SATER, B. L.  
An integrated photovoltaic/thermal High Intensity Solar Energy System /HISES/ concept for residential applications 13 p0039 A77-12818
- SATHAYE, J.  
Analysis of the California energy industry [LBL-5928] 16 p0557 N77-33640
- SATHEB, M. F.  
Compressed air energy storage - A near term option for utility application 13 p0027 A77-12727
- SATOH, Y.  
Studies on the energy system of Hokkaido. I - First attempt: Model-I, II - Various data and their basis. III - Simulations by Model-I 15 p0287 A77-33526
- SAULNIER, B.  
Rural energy centre for Africa using solar, wind and biogas energies 16 p0496 A77-49139
- SAUTER, G. D.  
Hydrogen energy - Its potential promises and problems 15 p0284 A77-33410  
Will the large-scale production of hydrogen be part of the energy problem or part of its solution 15 p0284 A77-33415  
Will the large-scale production of hydrogen be part of the energy problem or part of its solution [UCRL-76844] 13 p0087 N77-10652  
Hydrogen energy: Its potential promises and problems 14 p0246 N77-21648  
Will the large-scale production of hydrogen be part of the energy problem or part of its solution? 14 p0246 N77-21654  
Will a rapidly expanding power-generating system be part of the energy problem or part of its solution [UCRL-78500] 15 p0381 N77-26651
- SAUTY, J.-P.  
Recovery of heat energy from deep or shallow aquifers 14 p0175 A77-24206
- SAVERY, C. W.  
Double-exposure collectors with mirrors for solar-heating systems [ASME PAPER 76-WA/HT-16] 14 p0186 A77-26476
- SAVINO, J. M.  
Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 KW wind turbine tower [NASA-TN-X-73548] 13 p0114 N77-13534
- SAVITT, J. H.  
Electric energy usage and regional economic development [PB-257544/7] 14 p0208 N77-16449
- SAWALHA, H.  
Cuprous oxide Schottky photovoltaic cells as potential solar energy converters 13 p0076 A77-19088

- SAWATA, S.  
A terrestrial solar thermal electric power system  
- Development of basic model system 16 p0422 A77-44478  
Fundamental studies on heat storage of solar energy 16 p0423 A77-44490
- SAWATSKY, H.  
Sulfur compounds in oils from the Western Canada  
Tar Belt 14 p0169 A77-23553
- SAWNEY, B. K.  
Conductivity of seeded combustion products of  
acetylene systems 15 p0288 A77-34039  
Ionization instability in non-equilibrium MHD  
generators 16 p0416 A77-42894
- SAWKO, W.  
Economic and energy considerations in MHD seed  
regeneration 15 p0332 A77-39574
- SAWYER, R. F.  
The formation of nitrogen oxides from fuel nitrogen  
[PB-252462/7] 13 p0092 N77-10717
- SAKHNA, S. C.  
Mathematical modelling of coal combustion in  
fluidized beds with sulphur emission control by  
limestone or dolomite 16 p0508 A77-51587
- SAYIGH, A. A. M.  
Optimum design of a single slope solar still in  
Riyadh, Saudi Arabia 16 p0417 A77-42956
- SAYIGH, A. M.  
Thermo-chemical production of hydrogen 13 p0075 A77-19074  
Preliminary design data for a solar house in  
Riyadh, Saudi Arabia 13 p0078 A77-19112  
Geothermal energy in Saudi Arabia and its use in  
connection with solar energy 13 p0079 A77-19122
- SAYLOR, W.  
Multipurpose insulation system for a radioisotope  
fueled Mini-Brayton Heat Source Assembly 13 p0022 A77-12678
- SBERVEGLIERY, G.  
Preparation and characteristics of CuGaSe<sub>2</sub>/CdS  
solar cells 13 p0069 A77-18517
- SCANLON, M.  
The Lowell Observatory experimental solar heating  
module 16 p0476 A77-48976
- SCANNELL, E. P.  
Gaseous electrode development at RMC 15 p0325 A77-39530
- SCARNOZZINO, R.  
Efficiency tests on a linear parabolic  
concentrator for medium and high temperatures 13 p0077 A77-19103  
Simulation of the performance of a solar energy  
plant using uniaxial parabolic collectors, with  
a one-degree-of-freedom pointing system, at  
different latitudes 14 p0164 A77-23297
- SCARRAH, W. P.  
Startup solvent selection for the liquefaction of  
lignite 13 p0059 A77-16472
- SCAVUZZO, R. J.  
Vibration characteristics of a large wind turbine  
tower on non-rigid foundations  
[NASA-TN-X-73670] 15 p0378 N77-26613
- SCHAEFER, R.  
Approaches leading to an efficient use of energy,  
illustrated with the aid of examples concerning  
the rail traffic and low-temperature heat  
requirements 16 p0504 A77-51153
- SCHAEFGEN, J. R.  
Integrating community utilities for resource  
conservation  
[PB-256898/8] 13 p0133 N77-15923
- SCHAFER, C. T.  
Survey of high temperature thermal energy storage  
[SAND-75-8063] 13 p0088 N77-10655
- SCHALIT, L. M.  
Alternate petroleum based fuels for naval fleet  
usage: potential availability, cost, and system  
impact  
[AD-A041980] 16 p0551 N77-33372
- SCHAPIRO, A. R.  
Geothermal power cycle analysis 16 p0455 A77-48803
- SCHAEFFLER, B.  
Non-nuclear energy technology. Low temperature  
cable for power transmission  
[BHFT-FB-T-76-01] 14 p0210 N77-17372
- SCHERWIE, A.  
Energy requirement for the production of silicon  
solar arrays  
[NASA-CR-153409] 16 p0528 N77-30604
- SCHERLKOPF, J. D.  
Industrial energy conservation through integration  
of thermal energy storage into process energy  
dynamics 13 p0028 A77-12733
- SCHENCK, G. H. K.  
Historical trends in coal utilization and supply  
[PB-261278/6] 15 p0341 N77-22295
- SCHERREL, G.  
Plastics for solar-energy collectors. I - General  
aspects, hot-water collectors, design variants 13 p0009 A77-11267  
Plastics for solar-energy collectors. II - Typical  
operational data and model parameters,  
functional diagrams, optimization of layer  
thicknesses 13 p0009 A77-11269
- SCHIEPPAN, J. E.  
MHD power generation - 1976 Status Report 13 p0033 A77-12782
- SCHERBER, W.  
Novel development for economic solar-energy  
utilization 15 p0268 A77-32402
- SCHERTZ, W.  
Development of compound parabolic concentrators  
for solar-thermal electric and process heat  
applications 13 p0038 A77-12812  
Development of compound parabolic concentrators  
for solar thermal applications  
[ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516  
Development of lightweight compound parabolic  
concentrators for solar thermal electric and  
process heat applications 16 p0483 A77-49031
- SCHERTZ, W. S.  
Design problems associated with the use of  
evacuated glass receivers for solar collectors  
[CONF-7606128-1] 15 p0393 N77-27536
- SCHESKY, E.  
The propulsion system of the aircraft Z-37. I 14 p0156 A77-22121
- SCHINKE, G. R.  
Evaluation of the disposal of flue gas  
desulfurization wastes in mines and the ocean:  
Initial assessment  
[PB-269270/5] 16 p0561 N77-34058
- SCHINNEL, W. P., JR.  
Focused solar collector analysis with axially  
varying input due to shadowing from adjacent  
collectors 13 p0069 A77-18450  
Synergistic effects of shadowing on a solar  
collector matrix  
[SAND-76-0012] 13 p0122 N77-14587  
Focused solar collector analysis with axially  
varying input due to shadowing from adjacent  
collectors  
[SAND-76-5061] 15 p0345 N77-22635
- SCHINGWITZ, M.  
Hydrocarbon cracking developments in the DDR 14 p0164 A77-23098
- SCHIPPER, L.  
A comparison of residential and commercial energy  
use in the United States and Sweden 15 p0297 A77-36114  
Explaining energy: A manual of non-style for the  
energy outsider who wants in  
[LBL-4458] 13 p0122 N77-14592

- SCHLAG, J. B.  
Improved, inexpensive solar collectors for  
agricultural requirements 16 p0488 A77-49077
- SCHLAFBACH, L.  
A new hydrogen storage electrode 13 p0047 A77-13539
- SCHLESINGER, R. J.  
Hybrid simulation of solar HVAC system for house  
retro-fit design [PB-2526C8/5] 13 p0090 A77-10676
- SCHLIEBEN, R. W.  
Design definition of a mechanical capacitor  
[NASA-CR-152613] 16 p0552 A77-33603
- SCHLOTHANN, R.  
Recovering metal from trash 15 p0287 A77-33529
- SCHLOTTHANN, A.  
New life for old garbage - Resource and energy  
recovery from solid wastes 14 p0199 A77-29096
- SCHNEELZE, J.  
Development of a vertical axis wind turbine (phase  
1) [BNFT-FI-T-76-55] 14 p0209 A77-17112
- SCHNEELZER, L. J.  
Energy and environmental considerations in  
extending heat pump applications 13 p0062 A77-17058
- SCHNID, B. K.  
The SRC-II process 14 p0192 A77-27292
- SCHNID, L. C.  
Fusion energy option [BNWL-SA-5802] 14 p0213 A77-17891
- SCHNIDT-KUESTER, W.-J.  
Energy supply of the Federal Republic of Germany  
Development of new technologies for energy  
production in the Federal Republic of Germany  
16 p0419 A77-43566  
16 p0505 A77-51157
- SCHNIDT, E. F.  
The electrical power system for Spacelab 16 p0432 A77-46789
- SCHNIDT, E. J.  
Northeastern utilities are meeting the clean air  
challenge 16 p0424 A77-44612
- SCHNIDT, E. W.  
Thermochemical energy storage systems 13 p0028 A77-12738
- SCHNIDT, F. W.  
Transient behavior of solid sensible heat thermal  
storage units for solar energy systems 13 p0057 A77-16208
- Baseline gas turbine development program  
[COO-2749-15] 15 p0390 A77-27410
- SCHNIDT, G.  
Multipurpose insulation system for a radioisotope  
fueled Mini-Erayton Heat Source Assembly 13 p0022 A77-12678
- SCHNIDT, J.  
Alluvial valley floors in east-central Montana and  
their relation to strippable coal reserves. A  
reconnaissance report [PB-267280/6] 16 p0540 A77-31725
- SCHNIDT, P.  
Energy management for Texas commerce and industry  
[PB-268409/0] 16 p0548 A77-32616
- SCHNIDT, P. B.  
N-indium tin oxide/p-indium phosphide solar cells 15 p0317 A77-38049
- SCHNIDT, P. S.  
Performance of gas-turbines and combined cycles  
operating on fuels produced by in-situ  
gasification of lignite 16 p0446 A77-48723
- SCHNIDT, R. B.  
Prerequisites for military/civilian geopressured  
geothermal resource development 13 p0031 A77-12761
- SCHNIDT, T. W.  
Design factors for a cost effective solar  
collection system 16 p0496 A77-49143
- SCHNIESING, R. L.  
A status report on the USAFA solar energy program 16 p0478 A77-48993
- Solar heating retrofit of military family housing  
[AD-A030843] 14 p0226 A77-19659
- SCHNITT, R. C.  
Direct applications of geothermal energy 13 p0040 A77-12755
- Beneficial uses of geothermal energy description  
and preliminary results for phase 1 of the Raft  
River irrigation experiment [TREC-1048] 16 p0547 A77-32609
- SCHNITT, R. W.  
Future trends in electrical energy generation  
economics in the United States 15 p0317 A77-37960
- An econometric analysis of energy over the next 75  
years 16 p0414 A77-42637
- SCHNORDE, P.  
Electric current from the direct conversion of low  
molecular weight C,H,O-compounds 13 p0055 A77-15814
- SCHNACKENBERG, G. H.  
Development of fuel cell CO detection instruments  
for use in a mine atmosphere [PB-254823/8] 13 p0095 A77-11380
- SCHNEEBERG, R.  
Energy investment in nuclear and solar power plants 15 p0257 A77-30599
- SCHNEIDER, J. R.  
A large solar heating system for a Saudi campus  
complex 16 p0430 A77-46550
- SCHNEIDER, R. T.  
Safety flywheel [NASA-CASE-HQN-10888-1] 15 p0342 A77-22484
- SCHNEIDER, S. J.  
Joint test of an U.S. electrode system in the  
U.S.S.R. U-02 facility 14 p0139 A77-21415
- The second joint test of a U.S. electrode system  
in the U.S.S.R. U-02 facility 15 p0327 A77-39540
- SCHNEIDER, W.  
Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur-families 15 p0275 A77-33342
- Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur families 14 p0238 A77-21572
- SCHNEIDER, W. C.  
New themes for space: Mankind's future needs and  
aspirations; Proceedings of the Bicentennial  
Space Symposium, Washington, D.C., October 6-8,  
1976 16 p0430 A77-46627
- SCHNELL, R. C.  
Atmospheric ice nuclei - No detectable effects  
from a coal-fired powerplant plume 13 p0054 A77-15780
- SCHNELLE, J. F., JR.  
Potential alternative fuel derivatives from  
municipal solid wastes 16 p0433 A77-47213
- SCHNITZMEYER, J. B.  
Fermi function model absorption profile for  
solar-thermal conversion 16 p0483 A77-49035
- SCHNORR, R. F.  
Development of a baseline reference design for an  
open cycle MHD power plant for commercial service 14 p0140 A77-21232
- Open-cycle coal burning MHD power plants for  
commercial service 15 p0333 A77-39578
- SCHNORR, W. B.  
A study of the economic feasibility of a thermal  
energy storage system for solar heating  
applications using a PCM [ASME PAPER 76-WA/HT-63] 14 p0187 A77-26490
- SCHOCK, A.  
Isotope heat source for dynamic power systems 13 p0036 A77-12796
- SCHOCK, H.-W.  
Technology of large area Cu/x/S-CdS solar cells 14 p0149 A77-21798

- Investigation on the crystalline structure of  
Cu/x/S-Cds solar cells 14 p0149 A77-21803
- SCHOFIELD, A. E.  
The magnetic energy storage system used in ZT-1 15 p0299 A77-36314
- SCHOLAND, E.  
Gas economy - Gas technology 15 p0263 A77-31576
- SCHOLBE, W. E.  
EPA Van operational manual  
[PB-259177/4] 14 p0233 N77-20608
- SCHOLTEN, W. B.  
The photosynthesis energy factory - Analysis,  
synthesis, and demonstration 16 p0449 A77-48753
- SCHOOBER, W. T.  
Economic and institutional rationale for solar  
retrofitting - Case example: 'Project Sunshower' 16 p0495 A77-49131
- SCHOBA, F. C.  
Hydrocarbon fuels from oil shale 13 p0023 A77-12692
- SCHOIT, W.  
Hydrocarbon deposits beyond the shelf edge of the  
oceans 16 p0400 A77-40682
- SCHRAEDER, L.  
Design studies of the hydrogasification of coal 14 p0175 A77-24214
- SCHRAEDER, O. E.  
Application of advanced technology to future  
long-range aircraft  
[SAFE PAPER 1126] 13 p0016 A77-12194
- SCHRAAG, M. P.  
Performance of emission control devices on boilers  
firing municipal solid waste and oil  
[PB-257136/2] 13 p0133 N77-15550
- SCHRECK, R.  
Hybrid propulsion system for motor vehicles with  
predominantly intermittent mode of operation 14 p0171 A77-23900  
Hybrid drive with kinetic energy store as vehicle  
drive  
[UCRL-TRANS-11018] 13 p0120 N77-14486
- SCHREIBER, R. J.  
Evaluation of molten scrubbing for fine  
particulate control  
[PB-266092/6] 16 p0517 N77-28642
- SCHREINER, F.  
HYCSOS - A solar heating, cooling and energy  
conversion system based on metal hydrides 13 p0029 A77-12740  
A thermodynamic analysis of HYCSOS, a hydrogen  
conversion and storage system 15 p0280 A77-33387  
A thermodynamic analysis of HYCSOS, a hydrogen  
conversion and storage system 14 p0242 N77-21622
- SCHREITHUELLER, K. R.  
The utilization of solar energy in Central Europe 16 p0426 A77-45461
- SCHRECK, G. L.  
Fuel economy potential of a combined engine  
cooling and waste heat driven automotive  
air-conditioning system 13 p0020 A77-12665  
The role of simulation in the development of  
solar-thermal energy conversion systems 13 p0037 A77-12809
- SCHRETZMANN, K.  
Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process 15 p0276 A77-33350  
Hydrogen production by means of reactor heat using  
halogens and reversible electrochemical methods  
in a closed cycle process 14 p0238 N77-21582
- SCHRIDER, L. A.  
The status of instrumentation and process control  
techniques for in situ coal gasification 14 p0191 A77-26790  
Underground coal gasification - A status report 16 p0441 A77-48473  
Environmental impact studies related to  
underground coal gasification  
[TID-270C3] 13 p0100 A77-11573
- SCHUBERT, G.  
Thermal convection of water in a porous medium -  
Effects of temperature- and pressure-dependent  
thermodynamic and transport properties 14 p0145 A77-21546
- SCHUBERT, K.  
Cooling with solar energy 15 p0268 A77-32401
- SCHUBERT, K.-P.  
Possibilities for the solar air conditioning of  
buildings 15 p0335 A77-39978
- SCHUELER, D. G.  
The ERDA Photovoltaic Systems Definition Project 13 p0038 A77-12815
- SCHUEMANN, H.-W.  
Status report on the German experimental study for  
terrestrial solar electric generators 14 p0153 A77-21836  
Solar generators - Utilization of solar energy for  
supply of electric power 14 p0197 A77-28681  
Solar generators - Utilization of solar energy for  
power-supply applications 15 p0336 A77-39980
- SCHUETZ, G. H.  
Hydrogen producing cycles using electricity and  
heat - Hydrogen halide cycles: Electrolysis of HBr 14 p0171 A77-23719
- SCHUH, R.  
Space-to-earth power transmission system  
[NASA-TN-X-73489] 13 p0105 N77-12517
- SCHULLER, T. L.  
Dip coating process: Silicon sheet growth  
development for the large-area silicon sheet  
task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513
- SCHULTE, A.  
The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich 15 p0273 A77-33328
- SCHULTE, D. D.  
Methane production through bioconversion of  
agriculture residues 16 p0489 A77-49081
- SCHULTE, H.  
Combined heat and electricity generation as a  
means for saving primary energy 16 p0505 A77-51155
- SCHULTEN, R.  
The concept of 'nuclear hydrogen production' and  
progress of work in the Nuclear Research Center  
Juelich 15 p0273 A77-33328  
The future production of liquid and gaseous  
hydrocarbons through coal gasification and the  
long-term prospects of a hydrogen technology 16 p0505 A77-51156
- SCHULTZ, H.  
An optimization approach to the design of the  
preheater for a magnetohydrodynamic powerplant 15 p0318 A77-38207
- SCHULTZ, J.  
Solar heating and cooling systems - A reality today 15 p0292 A77-35154
- SCHULTZ, K. R.  
Design considerations for a noncircular Tokamak  
demonstration plant  
[GA-A-14074] 15 p0351 N77-22968
- SCHULTZ, L. A.  
Tests of oil recovery devices in broken ice  
fields, phase 2  
[AD-A025748] 13 p0110 N77-12572
- SCHULTZ, R. J.  
Direct applications of geothermal energy 13 p0030 A77-12755  
Conceptual study for total utilization of an  
intermediate temperature geothermal resource  
[ANCR-1260] 14 p0211 N77-17579
- SCHULZ, H.  
Molecular synthesis in the case of the  
Fischer-Tropsch synthesis - Reaction steps of  
the molecular synthesis by means of the  
catalytic transformation of carbon monoxide and  
hydrogen 15 p0268 A77-32248

- SCHULZ, H. W.  
Resource recovery technology for urban decision-makers  
[PB-252458/5] 13 p0093 N77-10964
- SCHULZE, W. D.  
The economics of solar home heating  
[GPO-85-329] 16 p0534 N77-31603  
Solar energy: Policy and prospects  
[PB-267986/8] 16 p0554 N77-33620
- SCHUMANN, G.  
The significance of nuclear energy for satisfying future energy requirements 15 p0333 A77-39649
- SCHURINK, P.  
Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975 14 p0154 A77-21850
- SCHUSTER, C. L.  
Natural gas massive hydraulic fracture research and advanced technology project  
[SAND-76-C723] 16 p0536 N77-31630
- SCHUSTER, J. R.  
Water Splitting - A progress report 15 p0274 A77-33330  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 16 p0457 A77-48812  
Development status of the fixed mirror solar concentrator 16 p0460 A77-48834
- SCHUTTE, A. H.  
Comparative economics for the Arthur D. Little extractive coking process 13 p0022 A77-12684
- SCHWARTZ, B.  
Stable semiconductor liquid junction cell with 9 percent solar-to-electrical conversion efficiency 15 p0290 A77-34429
- SCHWARTZ, B. B.  
Large-scale applications of superconductivity 16 p0412 A77-42475
- SCHWARTZ, H.-J.  
The computer simulation of automobile use patterns for defining battery requirements for electric cars 14 p0159 A77-22879
- SCHWABZ, D.  
Improvements in energy conversion technology 16 p0505 A77-51154
- SCHWEIG, H.  
Possibilities and economic limits concerning solar heating 14 p0197 A77-28679  
Possibilities and limitations concerning the economy of solar heating systems 15 p0337 A77-39990
- SCHWEITZER, J. K.  
ERDA/P&WA program for demonstration of advanced industrial gas turbine cooling and high pressure compressor technology 16 p0446 A77-48721
- SCHWUTKE, G. H.  
Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149815] 14 p0227 N77-19898  
Silicon ribbon growth by a capillary action shaping technique  
[NASA-CR-149814] 14 p0227 N77-19899
- SCIULLIANO, A.  
Cassava fuel alcohol in Brazil 16 p0444 A77-48707
- SCOTT-MONCK, J. A.  
Advanced silicon solar cell production technology  
[AIAA PAPER 77-485] 14 p0172 A77-23905  
Advanced high efficiency wraparound contact solar cell  
[AIAA PAPER 77-521] 14 p0174 A77-23934  
Development of standardized specifications for silicon solar cells  
[NASA-CR-135233] 16 p0520 N77-29604
- SCOTT, C. J.  
Heat transfer - A review of 1975 literature 13 p0002 A77-10615
- SCOTT, P. R.  
Enhanced energy utilization from a controlled thermonuclear fusion reactor  
[PB-260653/1] 14 p0234 N77-20879
- Assessment of laser-driven fusion  
[PB-260691/1] 14 p0234 N77-20880
- SCOTT, J. E.  
The solar water heater industry in South Florida - History and projections 13 p0018 A77-12403
- SCOTT, B.  
Technical prospects for commercial and residential distribution and utilization of hydrogen 15 p0283 A77-33404  
Technical prospects for commercial and residential distribution and utilization of hydrogen 14 p0245 N77-21642
- SCOTT, H. B.  
Experimental investigation on a direct coal-fired MHD generator 14 p0141 A77-21238  
Experimental investigation of multiple-loaded diagonal conducting wall generators 15 p0325 A77-39529  
Plasma luminosity fluctuations as a diagnostic tool 15 p0328 A77-39547  
On the nature of fluctuations in an open cycle magnetohydrodynamic generator 13 p0117 N77-13841
- SCOTT, H. W.  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project  
[NASA-CR-149242] 13 p0105 N77-12513
- SCOTT, R. D.  
A progress report on the national program for solar heating and cooling 14 p0170 A77-23656  
The United States National Program for the demonstration of solar heating and cooling in buildings - Progress report 16 p0470 A77-48918  
Design definition of a mechanical capacitor  
[NASA-CR-152613] 16 p0552 N77-33603
- SCOTT, R. E.  
Energy considerations in BHE power systems 13 p0077 A77-19099
- SCOTT, T. A.  
Santa Clara, California, community center, commercial solar demonstration legal alternatives, implications, and financing of solar heating and cooling by a municipal corporation  
[SAN/1083-76/1] 15 p0394 N77-27549
- SCULLY, D.  
A non-technical evaluation of four different concrete wall solar collector configurations 16 p0478 A77-48990
- SCULLY, D. V.  
Climate based solar house design - Hot and humid Charleston, S.C. 16 p0478 A77-48991
- SEADER, J. D.  
Recovery of bitumen from oil-impregnated sandstone deposits of Utah 14 p0194 A77-27349
- SEAHANS, R. C., JR.  
Energy and aerospace /Sixty-fifth Wilbur and Orville Wright Memorial Lecture/ 15 p0304 A77-36434
- SEARL, H. F.  
Proceedings of the Workshop on Analysis of 1974 and 1975 Power Growth  
[EPRI-BA-318-SE] 16 p0536 N77-31633
- SEARLE, W. B.  
XRF analysis of some regenerated catalysts  
[HRL-TN-388] 15 p0376 N77-26247
- SEARS, D. E.  
Environmental impact of major solar power development 16 p0452 A77-48773
- SECORD, T. C.  
Space construction base support requirements for environmental control and life support systems  
[ASME PAPER 77-ENAS-44] 16 p0432 A77-46885
- SECTOR, B. W.  
Demonstration of building heating with a heat pump using thermal effluent  
[AD-A041024] 16 p0530 N77-30631
- SEDERQUIST, R. A.  
Advanced fuel cell technology and applications 16 p0447 A77-48735

- SESESE, T. A.  
Gas-solid heat transfer coefficients in beds of  
crushed oil shale  
14 p0196 A77-28472
- SEGAL, B.  
Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- SEGASER, C. L.  
Energy conservation potential of Modular  
Integrator Utility Systems /MIUS/  
13 p0026 A77-12724
- MIUS systems analysis: Initial comparisons of  
modular-sized integrated utility systems and  
conventional systems  
[ORNL-HUD-MIUS-6] 14 p0249 N77-21684
- SEGINER, A.  
Flap-augmented shrouds for aerogenerators  
14 p0183 A77-26085
- SEGURA, A.  
Photovoltaic properties of GaSe and InSe junctions  
15 p0289 A77-34117
- SEHITOGLU, H.  
Techniques for the analysis of total energy and  
labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- SEIBOLD, G.  
Environmental protection measuring technique.  
Sensor for automatic continuous emission control  
of gases  
[BMPT-PE-T-76-03] 14 p0209 N77-16467
- SEIDEL, H. R.  
Economic benefits of energy conservation  
15 p0307 A77-36797
- State projections of industrial fuel needs  
[PB-263338/6] 15 p0356 N77-23620
- SEIFERT, G.  
Hydrocarbon cracking developments in the DDR  
14 p0164 A77-23098
- SEIFERT, W. W.  
Formulation of energy policies - The case of West  
Africa  
13 p0080 A77-19124
- SEITKURBANOV, S.  
Tests of a combined wind and solar power plant  
under natural conditions  
15 p0294 A77-35415
- SEIKEL, G. R.  
A summary of the ECAS MHD power plant results  
[NASA-TN-X-73491] 13 p0086 N77-10642
- SEKELA, A. H.  
Efficiency calculations for Al/x/Ga/1-x/As-GaAs  
heteroface solar cells  
15 p0257 A77-30720
- SELCKUR, M. K.  
A fixed collector employing reversible vee-trough  
concentrator and a vacuum tube receiver for high  
temperature solar energy systems  
13 p0038 A77-12813
- A non-tracking solar energy collector system  
[NASA-CASE-NPO-13813-1] 14 p0220 N77-19579
- A non-tracking solar energy collector system  
[NASA-CASE-NPO-13817-1] 16 p0513 N77-28583
- Solar energy collection system  
[NASA-CASE-NPO-13810-1] 16 p0545 N77-32582
- SELDEN, R. W.  
Energy and technology review  
[UCRL-52000-76-8] 15 p0345 N77-22627
- Energy and technology review  
[UCRL-52000-76-11] 15 p0396 N77-27651
- SELF, S.  
Optical measurements of mean particle size in the  
exhaust of a coal-fired MHD generator  
[WSS/CI PAPER 76-53] 16 p0508 A77-51611
- SELF, S. A.  
Laser anemometry in high velocity, high  
temperature boundary layers  
15 p0288 A77-33708
- Electron concentration measurements in combustion  
MHD flows by submillimeter laser interferometry  
16 p0425 A77-44821
- SELL, M.  
Energy analysis and the coupling of man and  
estuaries  
15 p0290 A77-34449
- SELLEN, J. H.  
Investigation of beamed energy concepts for  
propulsion. Volume 1: Systems studies  
[AD-A034995] 15 p0377 N77-26491
- SELLMAN, A. W.  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121
- SELMAN, A. L.  
Technologies lead to conservation  
15 p0305 A77-36634
- SELPH, C.  
Laser propulsion  
[IAP PAPER 76-166] 13 p0003 A77-10931
- SELVAGE, C.  
Optics in solar energy utilization II; Proceedings  
of the Seminar, San Diego, Calif., August 24,  
25, 1976  
14 p0203 A77-29576
- SENEHA, H. G.  
Investigation of the thermophysical  
characteristics of low-temperature heat pipes  
with metal-fiber wicks  
13 p0050 A77-14321
- Structural heat conductivity of fiber metal wicks  
for heat pipes  
13 p0050 A77-14326
- An analytical study of the maximal heat-carrying  
capacity of heat pipes  
16 p0411 A77-42260
- SENEHOV, A. A.  
Methodological questions concerning the evaluation  
of the economic potential of energy resources  
16 p0412 A77-42262
- SENIKOLENNIKH, N. L.  
Investigation of the mechanism of cleaning heating  
surfaces by the pulsation method  
[BLL-N-25448-(5828.4F)] 13 p0112 N77-13235
- SENFLE, F. E.  
Electrochemical neutralization of acid mine water  
16 p0420 A77-43651
- SENGUL, M.  
Numerical solution of heat conduction with phase  
change in cylindrical systems  
16 p0543 N77-32422
- SENIRNA, M. G.  
Investigation of the effective heat conductivity  
of metal-fiber wicks for low-temperature heat  
pipes  
16 p0500 A77-49988
- SENIS, B.  
Combined production of electrical power and  
desalinated water by nuclear power plants  
15 p0255 A77-30100
- SEO, B. T.  
Development program for solid electrolyte batteries  
[PB-260719/0] 15 p0341 N77-22398
- SEPSY, C. F.  
Solar absorption air-conditioning performance in  
central Ohio  
14 p0168 A77-23443
- SERAPHIN, B. O.  
Symposium on the Fundamental Optical Properties of  
Solids Relevant to Solar Energy Conversion  
[PB-256615/6] 13 p0108 N77-12538
- Investigation of high temperature performance of  
thin film, solar-thermal energy converters  
[PB-265554/6] 16 p0516 N77-28613
- SERATA, S.  
Compressed air energy storage for electric utility  
load leveling  
16 p0458 A77-48825
- SERBER, D.  
Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- SERBIN, V. I.  
Operation peculiarities of low temperature heat  
pipes with crimped capillary structure  
13 p0119 N77-14380
- Investigations of nonsteady-state processes at  
cryogenic heat pipe operation  
13 p0119 N77-14384
- SERGEEV, Y. Y.  
Operation peculiarities of low temperature heat  
pipes with crimped capillary structure  
13 p0119 N77-14380
- Investigations of nonsteady-state processes at  
cryogenic heat pipe operation  
13 p0119 N77-14384
- SERGEENT, A. H.  
GaAs double-heterostructure photodetectors  
16 p0426 A77-45304

- SERGEV, S. S.  
Supercorroding alloys for generating heat and hydrogen gas  
16 p0458 A77-48820
- SERRE, R. J.  
Geothermal water and gas: Collected methods for sampling and analysis: Comment issue [BNWL-2094]  
14 p0249 A77-21679
- SERPER, A.  
Selected aspects of waste heat management: A state-of-the-art study [PB-255697/5]  
13 p0100 A77-11563  
Selected aspects of waste heat management [PB-254401/3]  
13 p0109 A77-12568
- SERTH, R. W.  
High temperature thermal energy storage system, Na<sub>2</sub>SO<sub>4</sub> + SO<sub>3</sub> reversibly yields Na<sub>2</sub>SO<sub>3</sub>  
16 p0450 A77-48764
- SERVAIS, R. A.  
Energy and the environment; Proceedings of the Third National Conference, Oxford, Ohio, September 29-October 1, 1975  
15 p0291 A77-35146
- SETH, B. M.  
Spectral response of a laterally illuminated p-n junction  
13 p0062 A77-17478  
Response of a partially illuminated solar cell  
14 p0139 A77-21025
- SETH, R. L.  
Preparation of porous carbon electrodes for low temperature H<sub>2</sub>-O<sub>2</sub> fuel cells  
16 p0420 A77-44059
- SEUBERT, K.  
Emissions from compressor stations  
15 p0287 A77-33545
- SEVCIK, V. J.  
Thermal energy storage and transportation  
16 p0497 A77-49153
- SEVERSON, A. H.  
Low-profile heliostat design for solar central receiver systems  
16 p0422 A77-44480
- SEVIAN, W. A.  
Energy model data base program [BNL-21545]  
14 p0250 A77-21687
- SEWELL, W. R. D.  
Daedalaophobia - Diagnosis and prognosis  
16 p0494 A77-49121
- SEXTRO, R.  
Analysis of the California energy industry [LBL-5928]  
16 p0557 A77-33640
- SEYMOUR, W. C.  
Corrosion of potential MHD preheater materials in liquid slag and slag-seed  
15 p0327 A77-39541
- SGAMBETTERIA, E.  
Porous electrodes for Zn/air alkaline battery  
16 p0431 A77-46722
- SHADOV, V. P.  
Experimental research of oscillations in the discharge gap of plasma accelerator [IAP PAPER 77-104]  
16 p0507 A77-51431
- SHAFFER, L. H.  
Solar ponds - Low cost solar energy management systems  
16 p0408 A77-41851
- SHAFFRON, F.  
Design of the Montana Magnetohydrodynamics Component Development and Integration Facility  
16 p0458 A77-48822
- SHAPRANOV, V. D.  
Review of the state of the art with Tokamaks in USSR [EUR-CEA-EC-839-TR]  
16 p0541 A77-31981
- SHAR, R. D.  
Operation of the Westinghouse Coal Gasification Process Development Unit  
13 p0023 A77-12689
- SHAH, R. P.  
Future trends in electrical energy generation economics in the United States  
15 p0317 A77-37960  
Conceptual design of closed Brayton cycle for coal-fired power generation  
16 p0445 A77-48714
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles [NASA-CR-134949-VOL-2-PT-2]  
15 p0379 A77-26633
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 3: Open cycle gas turbines and open cycle MHD [NASA-CR-134949-VOL-2-PT-3]  
15 p0379 A77-26634
- Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment [NASA-CR-134949-VOL-3]  
15 p0380 A77-26636
- SHAHRYAR, I. M.  
Meeting electric power needs with photovoltaic power systems  
13 p0076 A77-19091
- SHAKESPEARE, W. J.  
Analysis of power cycles with centrifugal fluidized bed coal combustion  
16 p0453 A77-48787
- SHANNA, S. E.  
Ohm's law for plasmas with non-isotropic inhomogeneities and its effects on the performance of MHD generators  
15 p0329 A77-39555
- SHANS, A.  
The feasibility of solar house heating - A study in applied economics  
16 p0493 A77-49117
- SHANER, R. L.  
A study of the efficiency of hydrogen liquefaction  
15 p0279 A77-33377  
A study of the efficiency of hydrogen liquefaction  
14 p0240 A77-21611
- SHANER, W. W.  
Solar thermal electric power systems - Manufacturing cost estimation and systems optimization [ASME PAPER 76-WA/HT-14]  
14 p0186 A77-26474  
Solar thermal electric power systems - Comparison of line focus collectors  
16 p0483 A77-49032
- SHANKLIN, R. V.  
MHD power generation - 1976 Status Report  
13 p0033 A77-12782
- SHANKLIN, R. V., III  
Development of a baseline reference design for an open cycle MHD power plant for commercial service  
14 p0140 A77-21232
- SHANKS, R. B.  
Environmental effects of solid waste as a supplemental fuel [IS-3852]  
14 p0211 A77-17567
- SHANNON, D. W.  
Geothermal water and gas: Collected methods for sampling and analysis: Comment issue [BNWL-2094]  
14 p0249 A77-21679
- SHANNON, L. J.  
Environmental studies of the St. Louis-Union Electric refuse firing demonstration  
15 p0315 A77-37669
- SHANNON, R. L.  
Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant  
16 p0445 A77-48717
- SHAPIRO, M. M.  
Non-focussing solar concentrators of easy manufacture  
15 p0256 A77-30322
- SHAPIRO, P. S.  
The potential for transit as an energy saving option [PB-263087/9]  
15 p0359 A77-24019
- SHARER, J.  
Technical prospects for commercial and residential distribution and utilization of hydrogen  
15 p0283 A77-33408  
Technical prospects for commercial and residential distribution and utilization of hydrogen  
14 p0245 A77-21642
- SHARKEY, A. G., JR.  
Chemical characterization of diesel exhaust particulates [PERC/RI-77/5]  
16 p0540 A77-31671
- SHARMA, R. P.  
Conductivity of seeded combustion products of acetylene systems  
15 p0288 A77-34039



- Ionization instability in non-equilibrium MHD generators  
16 p0416 A77-42894
- SHARP, R.  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- SHARP, R. D.  
Advanced fuels for inertial confinement  
13 p0061 A77-17016
- SHARP, R. S.  
Water splitting - A progress report  
15 p0274 A77-33330
- SHARPE, M. H.  
Aluminum or copper substrate panel for selective absorption of solar energy and the method of producing said panel  
[NASA-CASE-MFS-23518-1] 16 p0535 N77-31610  
Stainless steel panel for selective absorption of solar energy and the method of producing said panel  
[NASA-CASE-MFS-23518-2] 16 p0535 N77-31611
- SHARYGIN, V. S.  
Closed costs of electrical energy for different zones of load graphs of electrical energy systems  
16 p0437 A77-47751
- SHATALOV, V. I.  
The possibility of using regression models for calculating the effect of weather conditions on electric energy demand  
16 p0411 A77-42259
- SHAUGHNESSY, T. P.  
Silicon thin film crystallization and solar cell fabrication  
[PB-261715/7] 15 p0348 N77-22670
- SHAW, D.  
A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families  
16 p0479 A77-48998
- SHAW, H.  
A preliminary engineering assessment of jet fuel production from domestic coal and shale derived oils  
13 p0023 A77-12690  
The New Mexico Department of Agriculture solar heated and cooled building  
[ASME PAPER 76-WA/SOL-10] 14 p0189 A77-26515  
Aviation turbine fuels from shale and coal oils  
15 p0291 A77-35150  
Environmental considerations in advanced energy conversion technology assessments  
16 p0452 A77-48777  
A comparison of the environmental impact of conventional and fluid bed boilers in advanced steam power plants  
16 p0452 A77-48779  
An environmental assessment of liquid metal topping cycles  
16 p0452 A77-48780  
An environmental assessment of a 638 MWe molten carbonate fuel cell power plant  
16 p0453 A77-48781  
A solar heated and cooled office building  
16 p0475 A77-48966
- SHAW, J. T.  
Theoretical work on reaction sequences in the gasification of coke by carbon dioxide and by steam in conditions remote from equilibrium  
14 p0198 A77-28776
- SHAW, L. E.  
A method of comparing flat-plate air and liquid solar collectors for use in space heating applications  
16 p0472 A77-48941
- SHAW, L. L.  
Design of a solar heating and cooling system for CSU Solar House II  
14 p0181 A77-25902
- SHAW, R.  
Thermochemistry of some six-membered cyclic and polycyclic compounds related to coal  
16 p0442 A77-48489
- SHAW, R. W., JR.  
Potential environmental impacts of solar heating and cooling systems  
[PB-259870/2] 14 p0226 N77-19683
- SHAY, J. L.  
Preparation of CdS/InP solar cells by chemical vapor deposition of CdS  
14 p0205 A77-29893  
InP-CdS solar cells  
15 p0259 A77-30740  
N-CdS/n-GaAs voltage-enhanced photoanode  
16 p0503 A77-50287
- SHAYSON, H. W.  
Jet fuel quality considerations  
15 p0272 A77-33273
- SECHAGIN, V. M.  
Thermal stability improvement of diesel fuels of isopropyloctadecylamine  
[NASA-TT-F-17300] 15 p0388 N77-27242
- SECHELOKOV, I. M.  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method  
[BLL-M-25448-(5828.4P)] 13 p0112 N77-13235
- SECHUKIN, V. K.  
Heat-pipe regenerator for gas turbine engine  
13 p0020 A77-12528
- SHEAHAN, R.  
A supplementary fuel for power generation /Ames, Iowa/  
16 p0433 A77-47214
- SHEARER, J.  
Reducing the environmental impact of solid wastes from a fluidized-bed combustor  
16 p0454 A77-48790
- SHEEHAN, T. V.  
Flash hydrolysis process for conversion of lignite to liquid and gaseous products  
15 p0301 A77-36334
- SHEFFIELD, J.  
Additional heating in JET  
16 p0407 A77-41718
- SHEPT, I.  
HYCSOS - A solar heating, cooling and energy conversion system based on metal hydrides  
13 p0029 A77-12740  
A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system  
15 p0280 A77-33387  
A thermodynamic analysis of HYCSOS, a hydrogen conversion and storage system  
14 p0242 N77-21622
- SHEIBLEY, D. W.  
New separators for nickel-zinc batteries  
[NASA-TN-X-3465] 13 p0121 N77-14585
- SHEINBAUM, I.  
Power production from high temperature geothermal waters  
13 p0030 A77-12751  
Power production from high salinity geothermal waters  
14 p0183 A77-26090  
Geothermal well stimulation with a secondary fluid  
16 p0454 A77-48795
- SHEINDLIN, A. R.  
Some results of an investigation with the U-25 experimental-industrial facility, aimed at raising its parameters to the design level  
14 p0136 A77-20105  
Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility  
14 p0139 A77-21215
- SHEKILADZE, I. G.  
The analysis of the temperature regimes of the operation of a gas-regulated heat pipe  
13 p0064 A77-17924
- SHELDON, R. E.  
Wind tunnel performance data for the Darrieus wind turbine with NACA 0012 blades  
[SAND-76-0130] 14 p0214 N77-18057  
Sandia vertical-axis wind turbine project  
[SAND-76-0581] 16 p0521 N77-29613
- SHELDON, C., II  
The development of net energy estimates for extraction, handling, and processing of selected fuels  
15 p0291 A77-35147
- SHELDON, M. W.  
Cost analysis of two air quality attainment strategies  
[PB-254182/9] 13 p0092 A77-10719

- SHELDON, R. C.  
The high temperature water cooled gas turbine in  
combined cycle with integrated low Btu  
gasification  
[ASME PAPER 77-JPGC-GT-7] 16 p0509 A77-51624
- SHELDON, R. D.  
Coal gasifier projects gather momentum 14 p0164 A77-26290
- SHELKOV, E. M.  
Joint US-USSR experimental studies of the  
dependence of plasma electrical conductivity on  
plasma temperature performed in the Avco Mark VI  
MHD facility 14 p0142 A77-21257
- SHELPOK, B.  
Solar heating thermal storage feasibility  
[ASME PAPER 76-WA/HT-36] 14 p0187 A77-26483
- SHELTON, R. M.  
Heating oils, 1976  
[BERC/PPS-76/4] 15 p0344 A77-22626
- SHEMLAKIN, V. YA.  
Processing of experimental data with the U-25  
facility with the aid of a data measuring system 15 p0269 A77-32521
- SHEW, J. S.  
Water requirements for steam-electric power  
generation and synthetic fuel plants in the  
western United States  
[PB-268067/7] 16 p0540 A77-31667
- SHEW, L.  
Investigation of factors influencing potassium  
seed recovery in a direct coal-fired generator  
system 15 p0331 A77-39570
- SHENG, H. P.  
Drying of refuse-derived fuel for energy recovery  
from municipal solid waste 14 p0182 A77-26071
- SHEPANSKI, J. R.  
Advanced fuel nuclear reaction feasibility using  
laser compression. II 16 p0435 A77-47359
- SHEPARD, N. F.  
Definition study for photovoltaic residential  
prototype system  
[NASA-CR-135039] 13 p0113 A77-13532
- SHEPARD, N. F., JR.  
Performance and cost analysis of photovoltaic  
power systems for on-site residential applications 13 p0038 A77-12816
- SHEPHERD, B. P.  
Preliminary analysis of electric generation  
utilizing geopressed geothermal fluids 13 p0030 A77-12752
- SHEPHERD, D. G.  
What price wind power 15 p0310 A77-37248
- A comparison of three working fluids for the  
design of geothermal power plants 16 p0455 A77-48800
- SHEPPARD, A. P.  
Improved, inexpensive solar collectors for  
agricultural requirements 16 p0488 A77-49077
- SHEPPARD, S. V.  
Energy reduction in cleaning exhausts containing  
particulates and noxious gases 16 p0414 A77-42740
- SHEPPARD, W. J.  
Systems study of fuels from sugar cane, sweet  
sorghum, and sugar beets  
[TID-27032] 14 p0211 A77-17570
- Systems study of fuels from sugarcane, sweet  
sorghum, sugar beets, and corn  
[TID-27336] 15 p0377 A77-26324
- SHERBIN, W. C.  
Atlanta /Towns/ solar experiment - The lessons we  
learned 13 p0047 A77-13503
- Lessons learned from Atlanta /towns/ solar  
experiment 16 p0423 A77-44491
- Lessons learned from Atlanta /Towns/ solar  
experiment 16 p0476 A77-48971
- SHERIDAN, W. R.  
The use of planar reflectors for increasing the  
energy yield of flat-plate collectors 16 p0472 A77-48937
- Modelling of a solar-operated absorption air  
conditioner system with refrigerant storage 16 p0475 A77-48963
- SHERMAN, A.  
The International Heat Pipe Experiment 13 p0120 A77-14389
- SHERMAN, P. W.  
Environmental and technical considerations  
concerning energy recovery from refuse combustion 15 p0292 A77-35157
- SHERMAZANIAN, IA. T.  
Design of a tracking system for a solar-energy  
installation 13 p0015 A77-11919
- SHERRY, E. V.  
Energy conservation by symbiosis 16 p0408 A77-41852
- SHERWIN, M.  
Liquid phase methanol  
[PB-257615/5] 14 p0212 A77-17594
- SHEVCHENKO, A. L.  
Determination of the non-equilibrium MHD generator  
optimal parameters in a thermonuclear power  
station with 'Tokamak' type reactor 15 p0326 A77-39537
- SHEVCHENKO, A. M.  
Burnout of gaseous fuel in a tube combustion  
chamber with longitudinally distributed air supply 15 p0272 A77-33170
- SHEVCHENKO, A. T.  
Allocation of standby power units in terms of the  
output power, in planning the development of  
power systems 14 p0167 A77-23406
- SHEVCHUK, E. M.  
Investigation of the flow and the temperature  
distribution in the vapor duct of a  
high-temperature heat pipe 15 p0306 A77-36708
- SHEVCHUK, M. S.  
Structural heat conductivity of fiber metal wicks  
for heat pipes 13 p0050 A77-14326
- SHEVELEVA, T. IU.  
Use of a carbon dioxide laser in remote detection  
of petroleum oil pollution at sea 16 p0433 A77-47080
- SHEVELL, R. S.  
Competitive restraints on air travel - Ground  
modes and telecommunications 16 p0409 A77-41939
- SHEVCHUK, J.  
A sulfurization process for the preparation of  
photovoltaic Cu/x/S and CuInS<sub>2</sub> thin films 13 p0076 A77-19087
- Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038
- Tunnel MIS solar cells 14 p0163 A77-22979
- SHIELDS, V. R.  
Preliminary design study of a baseline MHD  
[NASA-TN-X-58193] 16 p0561 A77-34050
- SHIH, C. H.  
Utility views of MHD power generation  
[AIAA 77-1010] 16 p0403 A77-41557
- SHIKOV, V. K.  
Heat transfer and resistance in the flow of  
nonequilibrium dissociating nitrogen dioxide 13 p0058 A77-16213
- SHINADA, K.  
Thermionic energy conversion technology - Present  
and future 14 p0173 A77-23918
- [AIAA PAPER 77-500] 16 p0466 A77-48890
- Low arc drop hybrid mode thermionic converter  
Solar thermionic power systems for terrestrial  
applications 16 p0466 A77-48893
- SHINN, R.  
Evaluating revenue sources for public transit - A  
new frontier for environmental planners 13 p0070 A77-18723
- SHIODA, S.  
MHD power generation with fully ionized seed 16 p0443 A77-48571
- SHIPPS, P. R.  
A development of high efficiency electric mini-cars 14 p0201 A77-29470

- SHIRLAND, P. A.  
Thin film solar cells for terrestrial applications  
[PB-255606/6] 13 p0109 N77-12553  
Thin film solar cells for terrestrial applications  
[PB-265963/7] 16 p0523 N77-29635
- SHISHKOV, B. V.  
Problems of analysis of the power characteristic  
of a high capacity magnetohydrodynamic power  
station 14 p0143 A77-21270
- SHITZER, A.  
Heat transfer analysis of a flat-plate solar  
energy collector 16 p0501 A77-50207
- SHIVES, T. R.  
Prevention of Failures in Coal Conversion Systems:  
Proceedings of the 24th Meeting of the  
Mechanical Failures Prevention Group  
[PB-265552/0] 15 p0395 N77-27563
- SHVETEV, A. D.  
Gas release during long-term operation of heat pipes  
13 p0C50 A77-14328
- SHOFFSTALL, D. R.  
Burner design criteria for control of NOx from  
natural gas combustion. Volume 1: Data  
analysis and summary of conclusions  
[PB-254167/0] 13 p0091 N77-10686  
Burner design criteria for control of NOx from  
natural gas combustion. Volume 2: Raw data and  
experimental results  
[PB-256806/1] 13 p0115 N77-13549  
Assessment application for direct coal combustion  
[PB-263651/2] 15 p0359 N77-24318
- SHONKA, D. B.  
Transportation Energy Conservation Data Book,  
supplement 2  
[ORNL-5247-SUPPL-2] 16 p0542 N77-32036
- SHOR, A. J.  
Precipitation and scaling in dynamic geothermal  
systems  
[ORNL-TM-5649] 14 p0249 N77-21680
- SHORE, S.  
Residential solar heating retrofit in the urban  
environment 16 p0478 A77-48992
- SHORTROSE, W. L.  
Designing gas turbines for the industrial and  
marine field 16 p0429 A77-46404
- SHERODT, J. T.  
Hot fuel gas desulfurization  
[PB-257036/4] 13 p0133 N77-15539
- SHULMAN, G. E.  
Energy equivalents for current and prospective  
automotive fuels in Canada  
[AD-A026195] 13 p0124 N77-14609
- SHULTIS, J. K.  
Perspectives in energy: 1976  
[CES-17] 15 p0372 N77-25636
- SHUM, J.  
Fine shredding of municipal solid waste  
[PB-257105/7] 13 p0133 N77-15919
- SHUPE, J. W.  
Geothermal energy in Hawaii - Hydrothermal systems  
13 p0029 A77-12741  
The Hawaii geothermal project, initial phase 2  
progress report  
[PB-263120/8] 15 p0355 N77-23594  
Energy Technologies for the West: Geothermal;  
Energy from the earth  
[TID-27431] 16 p0537 N77-31642
- SHURCLIFF, W. A.  
Active solar-heating systems for houses  
15 p0306 A77-36724
- SHUTKO, A. B.  
Microwave radiometry of land and water areas on  
the earth surface from onboard aircraft  
laboratories 16 p0433 A77-47201
- SHVALEVA, O. L.  
Some features of the operation of a solar  
installation acting as a low-temperature source  
of heat for a heat pump 13 p0015 A77-11924  
Calculation of the radiation entering a 'hot box'  
type solar set-up 13 p0051 A77-14581
- Calculation of radiation entering 'hot box' solar  
unit 15 p0291 A77-34975  
Solar heating in residential houses in Uzbekistan  
15 p0316 A77-37774  
Residential solar heating in Uzbekistan  
16 p0437 A77-47430
- SHVETSOV, G. A.  
Investigation of a coaxial explosion-type HHD  
generator 15 p0268 A77-32313
- SIBBITT, B. E.  
Radiant transmittance of V-corrugated transparent  
sheets with application to solar collectors  
[ASME PAPER 76-WA/SOL-1] 14 p0188 A77-26506
- SIDORAK, L. G.  
Solar cell shingle  
[NASA-CASE-LEW-12587-1] 16 p0534 N77-31601
- SIDORENKO, E. M.  
Operation peculiarities of low temperature heat  
pipes with crimped capillary structure  
13 p0119 N77-14380  
Investigations of nonsteady-state processes at  
cryogenic heat pipe operation 13 p0119 N77-14384
- SIDOROV, A.  
The technical concept of the IL-62H. II - Fuel  
system 14 p0156 A77-22120
- SIDOROVSKAYA, E. B.  
Liquid flow pattern in extraction of geothermal  
energy 14 p0135 A77-19706
- SIEBELS, J.  
Development of a turbine rotor of silicon nitride  
16 p0503 A77-50651
- SIEBERS, D. L.  
Comparison of long-term flat-plate solar collector  
performance calculations based on averaged  
meteorological data 15 p0256 A77-30315  
Thermal analysis of some flat-plate solar  
collector designs for improving performance  
[AIAA PAPER 77-727] 15 p0311 A77-37252  
Comparison of predicted performance of constant  
outlet temperature and constant mass flow rate  
collectors 16 p0423 A77-44489
- SIEBKER, E.  
Analysis of a Delphi study on hydrogen  
15 p0284 A77-33411  
Analysis of a Delphi study on hydrogen  
14 p0246 A77-21649
- SIEGEL, E. B.  
Catalytic coal gasification for SNG production  
13 p0022 A77-12683
- SIEGEL, S.  
Energy Technologies for the West: Can the  
Individual's Voice be Heard; Public  
Participation in Energy Planning  
[TID-27433] 16 p0537 N77-31643
- SIEGMUND, C. W.  
Influence of heavy fuel oil composition and boiler  
combustion conditions on particulate emissions  
13 p0008 A77-11162
- SIEMIENIEWSKA, T.  
Multi-stage activation of brown-coal chars with  
oxygen 16 p0401 A77-41319
- SIEVERS, G. E.  
NASA Quiet Clean General Aviation Turbofan (QCGAT)  
program status  
[NASA-TM-X-73564] 15 p0353 N77-23109
- SIPPERT, P.  
Open-circuit voltage of silicon solar cells  
14 p0151 A77-21820
- SIGALOV, I. U.  
Development and testing of solar water-heating  
boilers manufactured by diffusion welding  
15 p0316 A77-37773  
Development and testing of solar water-heater  
boilers fabricated by diffusion welding  
16 p0437 A77-47429
- SIGNORELLI, E. A.  
Cost/benefit assessment of the application of  
composite materials to subsonic commercial  
transport engines  
[NASA-TM-X-73557] 13 p0111 N77-13064

- SIGURDSSON, S.  
The utility of waters from the high-temperature areas in Iceland for space heating as determined by their chemical composition 13 p0012 A77-11496
- SIKKENS, M.  
Heat transfer problems in flat plate collectors 14 p0202 A77-29570
- SILBERBERG, I. B.  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 3: Reservoir Research and Technology [CONF-760222-P3] 14 p0249 A77-21678
- SILL, W. B.  
Dipole-dipole resistivity surveys, Roosevelt hot springs KGRA, volume 2 [PB-264897/0] 15 p0371 A77-25623
- SILVER, B. G.  
IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125] 13 p0122 A77-14594
- SILVER, B. B.  
Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750
- SILVERMAN, B. P.  
Development program for solid electrolyte batteries [PB-260719/0] 15 p0341 A77-22398
- SILVERMAN, B. D.  
Survey of technology for storage of thermal energy in heat transfer salt [ORNL-TM-5682] 15 p0392 A77-27513
- SILVESTER, L. P.  
Multiparameter optimization studies on geothermal energy cycles 16 p0456 A77-48804
- SILVESTRI, A. J.  
Mobil process for the conversion of methanol to gasoline 14 p0193 A77-27299
- SILVESTRINI, V.  
Solar energy conversion - Work experience of a team applying methods and techniques of physics research to this sector 14 p0164 A77-23296
- SINAROVSKII, L. B.  
Investigation of energy parameters of low-temperature ring thermopiles 16 p0409 A77-41902
- SIMMONS, D. B.  
Application of chemical engineering to large scale solar energy 16 p0491 A77-49098  
Demand sensitive energy storage in molten salts 16 p0491 A77-49102
- SIMMONS, J. A.  
Reversible oxidation of metal oxides for thermal energy storage 16 p0492 A77-49110  
Supply of liquefied natural gas to the Northeast [BNL-50556] 15 p0392 A77-27521
- SIMMONS, B.  
Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures 16 p0475 A77-48962
- SIMMONS, W. W.  
Status of large neodymium glass lasers 14 p0168 A77-23503
- SINICK, J. J.  
Vapor-liquid equilibrium of hydrogen/tetralin system at elevated temperatures and pressures 16 p0412 A77-42406
- SIMON, A. J.  
Thin film solar cells for terrestrial applications [PB-255606/6] 13 p0109 A77-12553  
Thin film solar cells for terrestrial applications [PB-265983/7] 16 p0523 A77-29635
- SIMON, F. P.  
Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161  
An experimental investigation with artificial sunlight of a solar hot-water heater 16 p0498 A77-49163  
Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator [NASA-TM-X-73520] 13 p0697 A77-11530
- SIMON, H. A.  
Solar retrofit in a large institutional building - An economic analysis 14 p0176 A77-24500
- SIMON, J.  
Testing and fabrication of solar absorbers for the D5A' satellite [CNES-WT-37] 13 p0111 A77-13110
- SIMON, B.  
The future of solar-thermal small-scale power stations 15 p0336 A77-39981
- SIMONEN, P. A.  
Analysis of ceramic materials for impact members in isotopic heat sources [BNI-X-670] 14 p0210 A77-17246
- SIMONETT, D.  
Analysis of information systems for hydropower operations: Executive summary [NASA-CR-149342] 13 p0122 A77-14586  
Analysis of information systems for hydropower operations [NASA-CR-149373] 13 p0129 A77-15497
- SIMONIANIS, A. A.  
Design of a tracking system for a solar-energy installation 13 p0015 A77-11919
- SIMONSON, G. B.  
Space shuttle missions of the 80's; Proceedings of the Twenty-first Annual Meeting, Denver, Colo., August 26-28, 1975. Parts 1 & 2 15 p0304 A77-36526
- SIMONSON, T.  
Energy management for commercial buildings and cooling storage [AIAA 77-1004] 16 p0402 A77-41552
- SIMPSON, C. A.  
Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids 14 p0145 A77-21623
- SIMPSON, F. B.  
A guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines 13 p0033 A77-12179  
Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396  
Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 A77-21634  
Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines [TRF-1036] 16 p0511 A77-28324
- SIMPSON, R. J.  
A new Chrome Black selective absorbing surface 16 p0406 A77-41585
- SIMS, C. T.  
Superalloys for advanced energy systems 13 p0061 A77-16824  
Superalloys - Their use and requirements in advanced energy systems 14 p0196 A77-28322
- SIMS, W. B.  
Considerations in the development of a high performance per unit cost solar collector 16 p0487 A77-49067
- SINCLAIR, G.  
Prospects for fusion energy 14 p0178 A77-24928
- SINDONI, I.  
Infrared extinction spectra of some common liquid aerosols 15 p0290 A77-34561
- SINGH, C.  
Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia 14 p0153 A77-21840
- SINGH, P.  
Temperature optimization for power production of infinite heat transfer solar absorbers 13 p0073 A77-19055
- SINGH, B.  
Theory of metal-insulator-semiconductor solar cells 14 p0156 A77-22038  
Tunnel MIS solar cells 14 p0163 A77-22979

- SINGH, S.  
Fuel contaminants. Volume 1: Chemistry  
[PB-256020/9] 13 p0103 N77-12231
- SINHA, A. K.  
Evaluation and targeting of geothermal energy  
resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642
- SINIYAVSKII, V. V.  
Anomalous current-voltage characteristics observed  
during reactor tests of multielement thermionic  
assemblies 13 p0018 A77-12361
- SINKEVICH, O. A.  
Construction of two-dimensional steady-state  
solution of equations of a nonequilibrium  
magnetized plasma 13 p065 A77-18130
- Limiting values of the energy generated by pulsed  
MHD-converters 15 p0316 A77-37929
- On the construction of plane stationary solutions  
of equations for nonequilibrium magnetized plasma  
16 p0420 A77-43705
- SIPE, W. G.  
A United States energy model economically driven  
by a global growth simulation 15 p0319 A77-38220
- SISLER, F. D.  
Electrochemical neutralization of acid mine water  
16 p0420 A77-43651
- SITLER, O. D.  
Energy content of winds in the high plains region  
of southwestern U.S. 16 p0490 A77-49089
- SITTON, O. C.  
Solar energy collection by bioconversion  
13 p0021 A77-12672
- SIUSIUKIN, A. I.  
Experimental investigation of energy conversion  
efficiency during the interaction of a  
conducting-fluid piston with a magnetic field  
14 p0204 A77-29618
- SIVINTSEV, I. V.  
Relative hazard of nuclear power stations and  
fossil-fuel power stations to the environment  
13 p0067 A77-18323
- SKABIN, A. P.  
Acoustic properties of subsonic MHD channel  
13 p0054 A77-15668
- SKANSER, R.  
Coal gasification commercial concepts: Gas cost  
guidelines [FE-1235-1] 13 p0130 N77-15500
- SKINNER, J.  
Electrochemical neutralization of acid mine water  
16 p0420 A77-43651
- SKINROOD, A. C.  
Coming - Solar power plants 13 p0016 A77-12125
- Development of the solar power central receiver  
concept [SAND-76-8677] 15 p0344 A77-22624
- SKOKAN, J. J.  
Geothermal exploration: An evaluation of the  
microseismic groundnoise method [PB-262575/4] 15 p0343 N77-22603
- SKOVORODIN, G. B.  
Effect of nitrogenous bases on the thermal  
stability of jet fuels [NASA-TN-75131] 15 p0388 N77-27243
- SKOVORONK, B. S.  
Improved systems for energy conversion and  
conservation as pebble-bed control alternatives -  
USEPA program 16 p0451 A77-48771
- SKUDELNY, H. C.  
Studies of electric vehicle drives, illustrated by  
the example of an urban estate car 14 p0160 A77-22893
- SKURIDIN, V. G.  
Testing the annular combustor of the NK-8  
aero-engine on natural gas 16 p0426 A77-45325
- SLADE, R. A.  
Thermally induced migration of hydrocarbon oil  
15 p0268 A77-32375
- SLATTERY, J. C.  
Interfacial effects in the recovery of residual  
oil by displacement: Studies at Northwestern  
University [COO-0019-5] 13 p0122 N77-14595
- SLAUGHTER, J.  
Study of silica scaling from geothermal brines  
[PB-262890/7] 15 p0357 N77-23626
- SLAWECKI, M. A.  
Design and testing of lithium/iron sulfide  
batteries for electric-vehicle propulsion  
14 p0161 A77-22910
- SLAYMAN, R. A.  
Cool it, sun 15 p0305 A77-36627
- SLEEPER, A. M.  
Neutral beam energy and power requirements for the  
next generation of tokamaks [ERDA-76-77] 14 p0213 N77-17883
- SLIMMER, P. A.  
Review of world experience and properties of  
materials for encapsulation of terrestrial  
photovoltaic arrays [NASA-CR-149451] 13 p0106 N77-12544
- SLUZALIS, L. L.  
Materials consideration for the Bigas coal  
gasification pilot plant [ASME PAPER 76-PVP-41] 15 p0323 A77-38825
- SMALL, J. A.  
Composition and size distribution of in-stack  
particulate material at a coal-fired power plant  
14 p0139 A77-21018
- SMEDES, H. W.  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121
- SNETANA, P. O.  
Solar assisted heat pumps: A possible wave of the  
future [NASA-CR-2771] 13 p0121 N77-14584
- An economic and performance design study of solar  
preheaters for domestic hot water heaters in  
North Carolina [NASA-CR-2813] 14 p0228 N77-20559
- SMIL, V.  
China claims lead in biogas energy supply  
15 p0297 A77-36050
- SMILEY, G. T.  
Sulfur compounds in oils from the Western Canada  
Tar Belt 14 p0169 A77-23553
- SMIRNOV, A. S.  
Investigation of the Hall effect in the plasma of  
an inductive high-frequency discharge 15 p0297 A77-36088
- SMITH, A. E.  
Solar energy application considerations for  
housing in depressed communities 16 p0494 A77-49126
- SMITH, C. C.  
Operational modes of solar heating and cooling  
systems 14 p0180 A77-25899
- Design of a solar heating and cooling system for  
CSU Solar House II 14 p0181 A77-25902
- Design application of the Hottel-Whillier-Bliss  
equation 15 p0255 A77-30309
- Comparative performance of solar heating with air  
and liquid systems 16 p0475 A77-48967
- Comparative performance of solar heating with air  
liquid systems [COO-2868-1] 15 p0383 N77-26676
- SMITH, F. L.  
Energy and environmental impacts of materials  
alternatives - An assessment of quantitative  
understanding 13 p0070 A77-18738
- SMITH, G. E.  
Heat and mass transfer analysis of Bacon-type  
hydrogen-oxygen fuel cells - The volume average  
velocity 15 p0321 A77-38531
- SMITH, G. G.  
Development and adaptation of field modulated  
generator systems for wind energy applications  
[PB-263604/1] 15 p0357 N77-23625

- SMITH, G. W.  
The assembly of large structures in space  
16 p0524 N77-29770
- SMITH, R. D.  
The evaluation of electrode materials for slag  
coated MHD channels  
15 p0328 A77-39545
- SMITH, R. W.  
Geothermal significance of magnetotelluric  
sounding in the eastern Snake River  
Plain-Yellowstone region  
15 p0310 A77-36999
- SMITH, I. E.  
Energy storage  
13 p0006 A77-11040
- SMITH, J.  
Answer House story  
15 p0333 A77-39664
- SMITH, J. L.  
Summary of 1976 geothermal drilling - Western  
United States  
15 p0286 A77-33522
- SMITH, J. M.  
Velocity and temperature distributions of  
coal-slag layers on magnetohydrodynamic  
generators walls  
[NASA-TN-D-8396]  
14 p0207 N77-16445  
Estimates of optimal generating conditions for  
hydrogen-oxygen cesium-seeded  
magneto-hydrodynamic power generator  
[NASA-TN-D-8374]  
14 p0213 N77-17852
- SMITH, J. W.  
In-place recovery of multiple products from  
Colorado's saline-mineral-bearing Piceance Basin  
14 p0193 A77-27344  
Refuse to energy Memphis style  
15 p0292 A77-35156
- SMITH, K. E.  
Commercial applications of solar total energy  
systems  
16 p0468 A77-48904
- SMITH, L. D.  
High power study, superconducting generators  
[AD-A031620]  
15 p0342 N77-22408
- SMITH, L. T.  
Solid waste incineration and energy recovery in  
hospitals  
15 p0272 A77-33283
- SMITH, M. C.  
The Los Alamos Scientific laboratory Dry Hot Rock  
Geothermal Project /LASL Group Q-22/  
14 p0163 A77-23032  
Energy extraction characteristics of hot dry rock  
geothermal systems  
16 p0455 A77-48798
- SMITH, O. J. M.  
Smith multimodule solar-electric plant  
16 p0482 A77-49023
- SMITH, P. R.  
Parametric studies of the thermal trap flat plate  
collector  
13 p0068 A77-18443  
Optimal overall efficiency for a solar radiation  
collector utilizing a two fluid Rankine Cycle to  
generate electrical power  
14 p0182 A77-26056  
The New Mexico Department of Agriculture solar  
heated and cooled building  
[ASME PAPER 76-WA/SOL-10]  
14 p0189 A77-26515
- SMITH, R. B.  
Earthquake surveys of the Roosevelt Hot Springs  
and the Cove Fort areas, Utah, volume 4  
[PB-268421/5]  
16 p0544 N77-32574
- SMITH, R. H.  
Solergy collector concept  
13 p0073 A77-19061  
Cylindrical mirror collector field  
13 p0074 A77-19071
- SMITH, R. R.  
Neutral injection at PPPL, past and present  
16 p0407 A77-41698
- SMITH, R. T.  
Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility  
13 p0043 A77-12867  
Large windpower systems integrated with existing  
electric utilities  
16 p0490 A77-49094
- Operational, cost, and technical study of large  
windpower systems integrated with existing  
electric utility  
[CONF-760906-8]  
14 p0222 N77-19609
- SMITH, T. B.  
The chemistry, dispersion, and transport of air  
pollutants emitted from fossil fuel power plants  
in California  
[PB-254449/2]  
13 p0092 N77-10720
- SMITH, T. F.  
Thermal, fluid flow and mechanical performance  
characteristics of a subatmospheric pressure,  
distributed flow flat plate collector  
16 p0473 A77-48945
- SMITH, W.  
Joint US-USSR experimental studies of the  
dependence of plasma electrical conductivity on  
plasma temperature performed in the Avco Mark VI  
MHD facility  
14 p0142 A77-21257
- SMITH, W. M.  
Acid mine drainage - The problem and the solution  
16 p0425 A77-45125
- SMITH, W. S.  
The energy crisis today - A perspective  
14 p0137 A77-20390
- SHOULDERS, P. T.  
Effects of wind fluctuations on windmill behaviour  
16 p0410 A77-42073
- SHULYAN, M. B.  
The hydrogen economy: A preliminary technology  
assessment  
[PB-266607/1]  
16 p0512 N77-28329
- SMITH, R. R.  
Progress on the testing of refractories for  
directly-fired MHD air heater service  
14 p0142 A77-21254  
Progress on the testing of refractories for  
directly-fired MHD air heater service. II  
15 p0328 A77-39544
- SNOW, D. B.  
Mathematics for energy  
[PB-252463/5]  
13 p0098 N77-11543
- SNYDER, C. E.  
Investigation of the causes of stuck servovalves  
in U.S. Army hydraulic systems using MIL-H-46170  
'Hydraulic Fluid, Rust Inhibited, Fire  
Resistant, Synthetic Hydrocarbon Base'  
[ASLE PREPRINT 77-AM-2A-1]  
15 p0296 A77-35956
- SNYDER, C. W.  
Worldwide energy development - Delayed opportunities  
14 p0147 A77-21762  
Application of the Alstom/Exxon alkaline fuel  
cell system to utility power generation  
[EPRI-EB-384]  
16 p0557 N77-33643
- SNYDER, R.  
Reducing the environmental impact of solid wastes  
from a fluidized-bed combustor  
16 p0454 A77-48790
- SNYDER, R. B.  
Synthetic additives for SO2 removal from  
combustion gas in a fluidized-bed coal combustor  
15 p0293 A77-35168
- SOATOV, P.  
Development and testing of solar water-heating  
boilers manufactured by diffusion welding  
15 p0316 A77-37773  
Development and testing of solar water-heater  
boilers fabricated by diffusion welding  
16 p0437 A77-47429
- SOBELMAN, I. I.  
On the solar energy problem  
14 p0138 A77-20742
- SODERSTROM, K. G.  
Self sufficient energy integrated design and  
construction method for low cost-self help  
housing programs  
16 p0495 A77-49137
- SODHA, M.  
Soot and gaseous pollutant formation in a burning  
fuel spray in relation to pressure and air/fuel  
ratio  
15 p0293 A77-35186
- SODHA, M. S.  
Conductivity of seeded combustion products of  
acetylene systems  
15 p0288 A77-34039

- Ionization instability in non-equilibrium MHD generators  
16 p0416 A77-42894
- SOBERGEL, D. G.  
The reporting of federal research and development resources applied to innovation [PB-266765/7]  
16 p0541 N77-32009
- SOHN, J. C.  
Water electrolysis under pressure - Improvement of energy efficiency by temperature increase  
15 p0277 A77-33360  
Water electrolysis under pressure: Improvement of energy efficiency by temperature increase  
14 p0238 N77-21594
- SOHN, R. L.  
Analysis of information systems for hydropower operations: Executive summary [NASA-CR-149342]  
13 p0122 N77-14586  
Analysis of information systems for hydropower operations [NASA-CR-149373]  
13 p0129 N77-15497
- SOININ, M.  
Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases  
14 p0195 A77-28050
- SOINI, H. E.  
Combined diesel-organic Rankine-cycle power plant  
16 p0459 A77-48830
- SOKOLOV, I. U. M.  
Effect of nonuniform conductivity in the boundary layer at the electrode wall on local characteristics of an MHD generator with a diagonal electrode configuration and a subsonic stream  
13 p0001 A77-10423
- SOKOLOV, O. B.  
Energy output and service life characteristics of high-voltage low-temperature thermopiles  
16 p0442 A77-48517
- SOKOLOV, V. E.  
The quality category in solar engineering  
14 p0143 A77-21310  
The use of lasers for the inspection of heliotechnical reflectors  
15 p0286 A77-33432  
Using lasers to inspect solar-energy reflectors  
16 p0427 A77-45545
- SOKOLSKI, D. V.  
Highly dispersed tungsten carbide for fuel cells with an acidic electrolyte  
13 p0055 A77-15815
- SOLASH, J.  
Evaluation of a JP-5 type fuel derived from oil shale [AD-A025417]  
13 p0112 N77-13231
- SOLBIS, A.  
Progress on the Mark VI long-duration MHD generator  
14 p0141 A77-21237  
Mark VI MHD generator studies  
15 p0325 A77-39528  
Electrode phenoxena in slagging MHD channels  
15 p0330 A77-39561  
Progress in channel development for direct coal fired MHD  
16 p0458 A77-48824
- SOLIMAN, M.  
A thermochemical data bank for cycle analysis  
15 p0276 A77-33346
- SOLIMAN, M. A.  
Stage efficiency in the analysis of thermochemical water decomposition processes  
13 p0047 A77-13538  
Hydrogen production via thermochemical cycles based on sulfur chemistry  
13 p0048 A77-13541  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
15 p0279 A77-33374  
A thermochemical data bank for cycle analysis  
14 p0238 N77-21578  
Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
14 p0240 N77-21608
- SOLIMAN, S. H.  
Optical performance of fixed zenith-moving azimuth paraboloid-cylindrical concentrator  
16 p0417 A77-42955
- SOLIMENE, N.  
Heat-pipe bismuth laser; examination of laser action at 4722 Å in bismuth vapor [AD-A039568]  
16 p0533 N77-31495
- SOLOMON, I.  
Solar energy - The good features of amorphous silicon  
16 p0438 A77-47850
- SOLOVIEVA, L. I.  
Cross structural plan of the earth's crust and the problem of the manifestation of its plutonic elements on the surface (Tyan-Shan and Turan plate as examples) [NASA-TT-X-73638]  
13 p0117 N77-13590
- SOLTIS, R. F.  
Results of baseline tests of the Lucas Limousine [NASA-TM-X-73609]  
14 p0214 N77-17947  
Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van [NASA-TM-X-73638]  
14 p0236 N77-21549
- SOM, P.  
An alternative fuel for cars  
13 p0050 A77-14530
- SOMERVILLE, M. B.  
An engineering, geological and hydrological environmental assessment of a 250 MMSCFD dry ash Lurgi coal gasification facility  
16 p0418 A77-43143
- SOMMER, A. E.  
Advanced thermionic converter development  
13 p0043 A77-12862  
High efficiency thermionic converter studies [NASA-CR-135263]  
16 p0546 N77-32592
- SOMOGYI, L. P.  
The potential for reusable homogeneous containers [PB-265100/8]  
16 p0518 N77-29007
- SOMUHA, C. B.  
Modeling of electric drive systems for KEW /flywheel/ vehicles  
14 p0200 A77-29469
- SONDER, E.  
Practical reasons for investigating ion transport in high temperature insulating materials [CONF-760831-2]  
14 p0227 N77-19935
- SONDREAL, E. A.  
Technology and use of low-rank coals in the USA [CONF-760495-1]  
15 p0392 N77-27519
- SONJU, O. K.  
Explosively driven MHD generator power systems for pulse power applications  
15 p0299 A77-36300  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser  
15 p0326 A77-39532
- SOOTS, V.  
Application of gravitational energy exchange to tracked urban transit systems  
14 p0200 A77-29468
- SOPER, W. G.  
The 10th International Power Sources Symposium [AD-A033323]  
15 p0347 N77-22656  
International Conference on Hydrogen and its Prospects [AD-A036936]  
15 p0385 N77-26696
- SORE, J.-C.  
World coal resources and the role of coal in turn-of-the-century energy economy  
14 p0198 A77-28758
- SORENSEN, B.  
Dependability of wind energy generators with short-term energy storage  
13 p0046 A77-13323  
Direct and indirect economics of wind energy systems relative to fuel based systems  
14 p0165 A77-23358
- SOROKIN, V. P.  
Operation peculiarities of low temperature heat pipes with crimped capillary structure  
13 p0119 N77-14380  
Some features of start-up of alkali metal heat pipes  
13 p0119 N77-14383  
Investigations of nonsteady-state processes at cryogenic heat pipe operation  
13 p0119 N77-14384

## PERSONAL AUTHOR INDEX

SQUIRE, W.

- SOSNEIKOV, V. N.  
Diffuse thermal model of electrode erosion for MHD generators  
13 p0049 A77-14319
- SOSNOWICZ, E. J.  
Compressed air energy storage for electric utility load leveling  
16 p0458 A77-48825
- SOUKUP, R. J.  
The lensed high-voltage vertical multijunction solar cell  
13 p0069 A77-18489  
Reply to 'New analysis of a high-voltage vertical multijunction solar cell'  
13 p0069 A77-18491  
The advantages of sun tracking for planar silicon solar cells  
14 p0181 A77-25904
- SOULE, D. E.  
Fermi function model absorption profile for solar-thermal conversion  
16 p0483 A77-49035
- SOUSSOU, J. E.  
Heliotechnique and development; Proceedings of the International Conference, Dhahran, Saudi Arabia, November 2-6, 1975. Volumes 1 & 2  
13 p0072 A77-19043  
Formulation of energy policies - The case of West Africa  
13 p0080 A77-19124
- SOUTHERLAND, S. E.  
An energy center in Sri Lanka  
13 p0021 A77-12669
- SOUTHWORTH, F. H.  
Studies of deuterium-fueled Tokamak reactors  
16 p0435 A77-47357
- SOVIE, R. J.  
Results of closed cycle MHD power generation tests with a helium-cesium working fluid  
15 p0326 A77-39533  
Results of closed cycle MHD power generation test with a helium-cesium working fluid  
[NASA-TM-X-73621]  
15 p0357 A77-23936
- SPACKMAN, W.  
The influence of the properties of coals on their conversion into clean fuels  
13 p0009 A77-11245
- SPANIO, L. A.  
Enzymatic hydrolysis of cellulosic wastes to fermentable sugars for alcohol production  
15 p0315 A77-37666
- SPARLING, A. B.  
Methane production through bioconversion of agriculture residues  
16 p0489 A77-49081
- SPARLING, R. C.  
Economics of crude oil and natural gas - Cost of adding production  
15 p0300 A77-36327
- SPARROW, E. H.  
Heat transfer - A review of 1975 literature  
13 p0002 A77-10615  
Solar-thermal energy systems  
15 p0262 A77-31472  
Circumferential variations of bore heat flux and outside surface temperature for a solar collector tube  
16 p0429 A77-46426
- SPARROW, E. B.  
Solar-thermal energy systems  
15 p0262 A77-31472
- SPEICH, P.  
Advanced gasification technologies  
15 p0308 A77-36811  
The future production of liquid and gaseous hydrocarbons through coal gasification and the long-term prospects of a hydrogen technology  
16 p0505 A77-51156
- SPEIDEL, T. O. P.  
Thermionic topping of a steam power plant  
13 p0034 A77-12789
- SPELTA, E.  
OPTIMO - A method for process evaluation applied to the thermocchemical decomposition of water  
15 p0320 A77-38526
- SPENCER, D. L.  
Thermal, fluid flow and mechanical performance characteristics of a subatmospheric pressure, distributed flow flat plate collector  
16 p0473 A77-48945
- SPENCER, E. G.  
N-indium tin oxide/p-indium phosphide solar cells  
15 p0317 A77-38049
- SPENCER, S. G.  
Beneficial uses of geothermal energy description and preliminary results for phase 1 of the Raft River irrigation experiment  
[TREE-1048]  
16 p0547 A77-32609
- SPENDLOVE, M. J.  
Recycling trends in the United States: A review  
[PB-254222/3]  
13 p0085 A77-10391
- SPERA, D. A.  
Dynamic blade loading in the ERDA/NASA 100 kW and 200 kW wind turbines  
[NASA-TM-73711]  
16 p0528 A77-30599  
Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator  
[NASA-TM-73718]  
16 p0529 A77-30611
- SPIROCK, S.  
The Westinghouse Sulfur Cycle for the thermochemical decomposition of water  
15 p0277 A77-33354  
Development progress on the Sulfur Cycle Water Decomposition System  
16 p0457 A77-48813  
The Westinghouse sulfur cycle for the thermochemical decomposition of water  
14 p0238 A77-21587
- SPICER, C. W.  
Measurement of dry deposition of fossil fuel plant pollutants  
[PB-264495/3]  
15 p0376 A77-25685
- SPIERINGS, P. A. H.  
Self-regulating composite bearingless wind turbine  
16 p0491 A77-49095
- SPIEWAK, I.  
Technical and economic studies of small reactors for supply of electricity and steam  
[IAEA-CN-36/398]  
16 p0560 A77-33678
- SPIGT, C. L.  
Design considerations on a thermal energy storage Stirling engine automobile  
[SAE PAPER 770080]  
16 p0424 A77-44558
- SPINKS, L. J.  
Some observations on the selection of gas turbine generating plant  
16 p0429 A77-46413
- SPRIGGS, D. E.  
Oxidation-erosion of materials in high velocity hot gases  
15 p0270 A77-32604
- SPRINGER, T.  
Storage of solar energy by inorganic oxide/hydroxides  
16 p0492 A77-49109
- SPRINGER, T. H.  
Central station solar electric power using liquid metal heat transport  
13 p0037 A77-12806
- SPRUNG, J. L.  
Tropospheric oxidation H2S  
16 p0411 A77-42254
- SPURA, S. A.  
Selective black absorbers using RF-sputtered Cr2O3/Cr cermet films  
15 p0265 A77-31951
- SPOERRER, P. R.  
Thermal energy storage  
16 p0461 A77-48841
- SPYCKERELLE, C.  
The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study  
16 p0438 A77-4765
- SPYRIDONOS, A.  
Heating a building by means of solar and electrical energy  
13 p0078 A77-19113
- SQUIRE, W.  
Numerical solution for the unsteady lifting characteristics of variable pitch cross-flow wind turbines  
13 p0044 A77-12871



- SQUIRES, A. H.**  
Gasification of coal in high-velocity fluidized beds  
14 p0175 A77-24211  
Applications of fluidized beds in coal technology  
15 p0262 A77-31470
- SRAHEK, B. H.**  
Analysis of state solar energy options  
[PE-254730/5] 13 p0091 N77-10688
- SREE HARSHA, K. S.**  
N-indium tin oxide/p-indium phosphide solar cells  
15 p0317 A77-38049
- SRESNEWSKY, S.**  
Cassava fuel alcohol in Brazil  
16 p0444 A77-48707
- SRINIVASAN, S.**  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
15 p0277 A77-33359  
A hydrogen-halogen energy storage system for electric utility applications  
16 p0457 A77-48818  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
[BNL-20877] 13 p0087 N77-10648  
Hydrogen for energy storage: A progress report of technical developments and possible applications  
[BNL-20931] 13 p0094 N77-11201  
Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
14 p0238 N77-21593  
Hydrogen storage, water electrolysis and fuel cells for electric energy storage  
[BNL-21498] 15 p0344 N77-22620  
Hydrogen-halogen energy storage system: Preliminary feasibility and economic assessment  
[BNL-22164] 16 p0537 N77-31635
- SRIRAMULU, V.**  
The rate of mass transfer in a solar regenerator  
15 p0323 A77-39109
- SROBAR, F.**  
Photovoltaic conversion of solar energy  
13 p0058 A77-16368
- STAATS, G. E.**  
Gaseous electrode development at EMC  
15 p0325 A77-39530
- STACEY, W. H., JR.**  
Tokamak experimental power reactor  
[ASME PAPER 76-WA/NE-11] 14 p0188 A77-26496  
Tokamak experimental power reactor  
[CONF-761107-23] 15 p0397 N77-27946
- STACHEL, A.**  
Woltersberg - A subterranean storage place for natural gas at a depth of 3000 m  
15 p0334 A77-39669
- STADLER, H. L.**  
Energy saving potential of engine-electric vehicular drives  
13 p0025 A77-12708
- STAEBLER, A.**  
Additional heating and refuelling for the ASDEX divertor Tokamak  
16 p0407 A77-41710
- STAMPER, K. E.**  
Fuel consumption, emissions, and power characteristics of the 1975 Ford 140-CID automotive engine, experimental data  
[PB-261771/0] 15 N77-22725
- STANIC, S. I.**  
Solar energy application considerations for housing in depressed communities  
16 p0494 A77-49126
- STANLEY, W. D.**  
Geothermal significance of magnetotelluric sounding in the eastern Snake River Plain-Yellowstone region  
15 p0310 A77-36999
- STANLEY, W. L.**  
The military utility of very large airplanes and alternative fuels  
16 p0434 A77-47271  
Some cost, energy, environmental, and resource implications of synthetic fuels produced from coal for military aircraft  
[AD-A026667] 13 p0118 N77-14271
- The potential role of technological modifications and alternative fuels in alleviating Air Force energy problems  
[AD-A039597] 16 p0525 N77-30261
- STANTON, G. C.**  
Development of nondestructive evaluation methods for coal-conversion systems  
[CONF-760472-2] 14 p0216 N77-18567
- STARGARDT, W. W.**  
An economic analysis of thermic diode solar panels  
[ASME PAPER 76-WA/SOL-7] 14 p0188 A77-26512
- STARLING, K. E.**  
The use of mixture working fluids in geothermal binary power cycles  
16 p0455 A77-48802  
Sensitivity analysis for OTEC propane and mixture cycles  
16 p0485 A77-49047  
Resource utilization efficiency improvement of geothermal binary cycles, phase 1  
[OHO-4944-3] 13 p0123 N77-14600
- STARR, C.**  
The year 2000 - Energy enough  
15 p0306 A77-36725
- STARR, V. P.**  
Electric energy from atmospheric water vapor  
13 p0077 A77-19097
- STASKUS, J. V.**  
Test program for transmitter experiment package and heat pipe system for the communications technology satellite  
[NASA-TM-X-3455] 13 p0095 N77-11268
- STATLER, R. L.**  
Navy applications for terrestrial photovoltaic solar power  
[AD-A030529] 14 p0218 N77-18590
- STAUCH, L.**  
Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility  
15 p0271 A77-32800
- STAUFFER, J. L.**  
Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation  
[PB-268232/6] 16 p0542 N77-32051
- STEELE, R. V.**  
Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary  
[PB-255994/6] 13 p0107 N77-12533  
Impacts of synthetic liquid fuel development. Automotive market. Volume 2  
[PB-255995/3] 13 p0108 N77-12534  
Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system  
[PB-262512/7] 15 p0361 N77-24504  
Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system  
[PB-262513/5] 15 p0361 N77-24505  
The potential for reusable homogeneous containers  
[PB-265100/8] 16 p0518 N77-29007
- STEELE, W. H.**  
A precise satellite thermal control system using cascaded heat pipes  
[AIAA PAPER 77-777] 15 p0312 A77-37282
- STEIDEL, R.**  
Performance test of a bladeless turbine for geothermal applications  
[UCID-17068] 14 p0212 N77-17581
- STEIN, C.**  
Critical materials problems in energy production  
16 p0509 A77-51627  
Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- STEIN, R. L.**  
A compound parabolic concentrator array optimized for northern climates  
16 p0474 A77-48958
- STEIN, R. G.**  
Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- STEIN, R. L.**  
Size distribution and mass output of particulates from diesel engine exhausts  
[PB-261416/2] 15 N77-22732

## PERSONAL AUTHOR INDEX

STEWART, R. E. D.

- STEIN, T. E.  
Upgrading coal liquids to gas turbine fuels. II -  
Compatibility of coal liquids with petroleum fuels  
14 p0177 A77-24852  
Upgrading coal liquids to gas turbine fuels. III -  
Exploratory process studies  
14 p0178 A77-24853
- STEINBERG, M.  
Nuclear power for the production of synthetic  
fuels and feedstocks  
13 p0035 A77-12790  
Air, water, nuclear power make gasoline  
13 p0045 A77-12935  
Parametric studies of applications of controlled  
thermonuclear reactor fusion energy for food  
production  
14 p0194 A77-27356  
Flash hydrolysis process for conversion of  
lignite to liquid and gaseous products  
15 p0301 A77-36334  
Synthetic carbonaceous fuel and feedstock using  
nuclear power, air and water  
15 p0321 A77-38532  
Synthetic carbonaceous fuels and feedstocks from  
oxides of carbon and nuclear power  
16 p0444 A77-48711
- STEINBORN, G.  
Hydrogen production using nuclear heat  
13 p0057 A77-16211  
Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur-families  
15 p0275 A77-33342  
Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine-, iron-sulfur- and  
manganese-sulfur families  
14 p0238 A77-21572
- STEINER, D.  
Nuclear fusion - Focus on Tokamak  
16 p0407 A77-41645
- STEKLY, Z. J. J.  
Superconducting magnets for an MHD test facility  
and base load power plant  
14 p0144 A77-21379
- STELLA, P.  
Low reflectivity solar cells  
[AD-A025922]  
13 p0108 A77-12539
- STENBERG, V. I.  
Catalytic hydrogenation of solvent-refined lignite  
to liquid fuels  
13 p0008 A77-11243
- STENGER, F. J.  
Results of baseline tests of the EVA Metro sedan,  
Citri-car, Jet Industries Electra-van, CDA town  
car, and Otis P-500 van  
[NASA-TM-X-73638]  
14 p0236 A77-21549
- STEPANCHUK, V. P.  
New requirements for the development and design of  
thermal power systems  
14 p0167 A77-23407
- STEPHAN, W.  
Comparison of electric drives for road vehicles  
14 p0162 A77-22918
- STEPHENS, J. B.  
Solar energy collection system  
[NASA-CASE-NPO-13579-2]  
14 p0229 A77-20565  
Low cost solar energy collection system  
[NASA-CASE-NPO-13579-3]  
14 p0229 A77-20566  
Solar pond  
[NASA-CASE-NPO-13581-2]  
16 p0513 A77-28584
- STEPHENS, W. T.  
Airborne and mobile ground level measurements of  
pollutants in the sphere of influence of a  
coal-fired electric generating station  
16 p0504 A77-51135
- STEPHENS, R. B.  
Steam recovery - An alternative for intermediate  
size regions  
16 p0434 A77-47222
- STEPNIEWSKI, W. Z.  
Energy aspects of VTOL aircraft in comparison with  
other air and ground vehicles  
16 p0419 A77-43333
- STERN, R. D.  
SO2 control technologies - Commercial  
availabilities and economics  
14 p0191 A77-27279
- Proceedings: Symposium on Flue Gas  
Desulfurization, volume 1  
[PB-255317/0]  
13 p0110 A77-12597
- STERNFELD, J.  
The storage of energy in future energy supply  
systems  
[DGLR PAPER 76-182]  
13 p0059 A77-16543
- STEUBENBERG, R. K.  
Lithium-aluminum/metal sulfide batteries  
[AIAA PAPER 77-483]  
14 p0172 A77-24903
- STEVENS, G. H.  
Space-to-earth power transmission system  
[NASA-TM-X-73489]  
13 p0105 A77-12517  
Statistics of the radiated field of a  
space-to-earth microwave power transfer system  
[NASA-TM-X-73684]  
16 p0526 A77-30314
- STEVENS, H. O.  
Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361
- STEVENS, M. J.  
Preliminary report on the CTS transient event  
counter performance through the 1976 spring  
eclipse season  
[NASA-TM-X-73487]  
13 p0083 A77-10116
- STEVENS, T. H.  
The economics of solar home heating systems for  
the southwest region  
15 p0309 A77-36824
- STEVENS, W.  
The New Mexico Department of Agriculture solar  
heated and cooled building  
[ASME PAPER 76-WA/SOL-10]  
14 p0189 A77-26515  
A solar heated and cooled office building  
16 p0475 A77-48966
- STEVENS, W. H.  
Peak power and heavy water production from  
electrolytic H2 and O2 using CANDU reactors  
15 p0274 A77-33332
- STEWART, W. G.  
Experimental evaluation of a stationary spherical  
reflector tracking absorber solar energy collector  
[ASME PAPER 76-WA/HT-10]  
14 p0186 A77-26470
- STEWART, D. H.  
Recommendations for a US geothermal research plan,  
volume 1  
[PB-261566/4]  
15 p0346 A77-22640  
Recommendations for a US geothermal research plan.  
Volume 2: Executive summary  
[PB-261568/0]  
15 p0346 A77-22642  
Recommendations for a geothermal utilization plan,  
Volume 3  
[PB-261569/8]  
15 p0346 A77-22643
- STEWART, G. H.  
Recommendations for a US geothermal research plan.  
Volume 1: Appendix A: Glossary. Appendix B:  
Task analysis sheets  
[PB-261567/2]  
15 p0346 A77-22641
- STEWART, G. S.  
Dual purpose nuclear power plants for military  
installations  
[AD-A026141]  
13 p0132 A77-15521
- STEWART, R. J.  
Dual optimum aerodynamic design for a conventional  
windmill  
13 p0048 A77-13704
- STEWART, I. MCC.  
Reaction rate analysis of borehole 'in-situ'  
gasification systems  
16 p0440 A77-48177
- STEWART, P. J.  
Future trends in electrical energy generation  
economics in the United States  
15 p0317 A77-37960  
An econometric analysis of energy over the next 75  
years  
16 p0414 A77-42637
- STEWART, R. D.  
Energy Conservation Alternatives Study (ECAS),  
phase 2: Volume 2: Advanced energy conversion  
systems, - conceptual designs. Part 1:  
Analytical approach  
[NASA-CR-134949-VOL-2-PT-1]  
15 p0379 A77-26632
- STEWART, R. E. D.  
An assessment of mechanical energy storage for  
solar systems  
16 p0460 A77-48839

## STICKFORD, G. H., JR.

- An averaging technique for predicting the performance of a solar energy collector system  
16 p0480 A77-49008
- STICKLE, J. W.  
Technical highlights in general aviation  
[AIAA PAPER 77-312] 13 p0C66 A77-18237
- STICKLER, D. B.  
Slag interaction phenomena on MHD generator electrodes  
[AIAA PAPER 77-109] 14 p0135 A77-19833  
Replenishment processes and flow train interaction  
14 p0139 A77-21223  
Applications of the rapid devolatilization of coal in MHD power cycles  
14 p0141 A77-21249  
Slag flow and current transport in a simulated generator environment  
15 p0330 A77-39562  
Devolatilization of pulverized coal during rapid heating  
15 p0331 A77-39566  
Ignition and combustion behavior of pulverized coal jets in hot oxidizing atmospheres  
15 p0331 A77-39568  
Modelling of entrained-bed pulverized coal gasifiers  
16 p0401 A77-41321  
Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers  
[WSS/CI PAPER 76-25] 16 p0419 A77-43593  
CDIF combustor design  
[TID-27143] 15 p0377 A77-26393
- STICKLES, R. F.  
The relative advantages of coal conversion routes for electric power generation  
15 p0300 A77-36330
- STICKNEY, G. H.  
Windmill optimization  
14 p0183 A77-26086
- STICKSEL, P. R.  
Evaluation of the potential environmental effects of wind energy system development  
[ERDA/NSF-07378/75/1] 15 p0382 A77-26663
- STILES, A. B.  
Methanol, past, present, and speculation on the future  
15 p0289 A77-34114
- STILLER, J.  
Curve of current delivered from MHD generator to a conventional power grid by inverter system  
14 p0141 A77-21253
- STINNETT, L. A.  
Availability of potential coal supply through 1985 by quality characteristics  
[PB-256680/0] 13 p0121 A77-14573
- STIRN, R. J.  
Technology of GaAs metal-oxide-semiconductor solar cells  
15 p0259 A77-30739  
High-efficiency thin-film GaAs solar cells  
[PB-258493/6] 14 p0212 A77-17599
- STITT, W. C.  
Summary of EPA energy policy analysis  
[PB-253361/0] 13 p0089 A77-10669
- STOKER, R.  
On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs  
16 p0454 A77-48796
- STOKES, B.  
Survey of alcohol fuel technology, volume 1  
[PB-256007/6] 13 p0112 A77-13232  
Survey of alcohol fuel technology, Volume 2  
[PB-256008/4] 13 p0112 A77-13233
- STOKES, C. A.  
An overview of the U.S. energy dilemma  
14 p0192 A77-27294  
A new concept for the manufacture of low sulfur fuels and chemicals from coal  
14 p0192 A77-27295
- STOLARSKI, R. S.  
Energetics of the midlatitude thermosphere  
13 p0012 A77-11492
- STOLL, R. D.  
Solar collector manufacturing activity, January-June 1976  
[PB-258665/5] 14 p0208 A77-16455  
Solar collector manufacturing activity  
[PB-266985/1] 16 p0558 A77-33664

## STOLLER, R. H.

- The status of instrumentation and process control techniques for in situ coal gasification  
14 p0191 A77-26790
- STONE, J. H.  
Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5] 16 p0516 A77-28610
- STONE, P. H.  
Neutral beam energy and power requirements for the next generation of tokamaks  
[ERDA-76-77] 14 p0213 A77-17883
- STONE, R.  
Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California  
[UCRL-52180] 16 p0536 A77-31628
- STONE, R. G.  
Composite fiber flywheel for energy storage  
15 p0306 A77-36672  
Composite fiber flywheel for energy storage  
[UCRL-78085] 14 p0225 A77-19645  
Fiber composite program for flywheel applications  
[UCRL-50033-76-1] 15 p0345 A77-22633
- STONE, B. L.  
Thermal barrier coating on high temperature industrial gas turbine engines  
[NASA-CR-135147] 15 p0390 A77-27496
- STORELLI, V.  
Advanced technologies for photovoltaic cell fabrication  
14 p0165 A77-23300
- STORTI, G.  
CdS-Cu<sub>2</sub>S solar cells fabricated on Cd<sub>2</sub>SnO<sub>4</sub>-silica substrates  
13 p0007 A77-11110  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications  
16 p0486 A77-49059
- STOSUR, J. J.  
Approaches to extracting potentially recoverable hydrocarbons  
15 p0322 A77-38786
- STORSKII, G. I.  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- STOUDT, R. A.  
Development of a baseline reference design for an open cycle MHD power plant for commercial service  
14 p0140 A77-21232  
Status of the reference dual-cycle MHD-steam power plant  
15 p0332 A77-39577
- STOUT, W. D.  
Pyrolysis of oil shale: The effects of thermal history on oil yield  
[UCRL-77831] 13 p0129 A77-15499
- STOVER, J.  
ERDA/Lewis research center photovoltaic systems test facility  
[NASA-TN-X-73641] 15 p0343 A77-22609
- STONEWELL, S. A.  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- STOY, B.  
Approaches leading to an efficient use of energy, illustrated with the aid of examples concerning the rail traffic and low-temperature heat requirements  
16 p0504 A77-51153
- STRAKEY, J. P.  
The SYNTHANE process - Current status  
14 p0192 A77-27286
- STRATHAN, J.  
Regional economic impacts of nuclear power plants  
[BNL-50562] 16 p0540 A77-31676
- STRAUGHAN, D.  
Temperature effects of crude oil in the upper intertidal zone  
[PB-255956/5] 13 p0110 A77-12581
- STRAUS, J. H.  
Thermal convection of water in a porous medium - Effects of temperature- and pressure-dependent thermodynamic and transport properties  
14 p0145 A77-21546

- STRAUSE, O. P.**  
The origin of the oil sand bitumens of Alberta - A chemical and a microbiological simulation study  
16 p0438 A77-47765
- STRAZISAR, A. J.**  
Size distribution and mass output of particulates from diesel engine exhausts  
[PB-261416/2] 15 N77-22732
- STREBKOV, D. S.**  
Physical principles underlying the conversion of concentrated solar energy with the aid of semiconductor photoconverters  
16 p0402 A77-41360
- STREED, E.**  
Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
[PB-257770/8] 14 p0208 N77-16452
- STREED, E. R.**  
A method of testing for rating solar collectors based on thermal performance  
13 p0019 A77-12408
- STREKALOV, N. N.**  
Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator  
15 p0329 A77-39554
- STRELKOV, V. S.**  
Review on the IAEA workshop on large fusion Tokamak projects  
14 p0146 A77-21737
- Review of the state of the art with Tokamaks in USSR**  
[EUR-CEA-FC-839-TR] 16 p0541 N77-31981
- STRICKLAND, G.**  
The behavior of iron titanium hydride test beds - Long-term effects, heat transfer and modeling  
15 p0280 A77-33386
- Hydrogen for energy storage: A progress report of technical developments and possible applications**  
[BNL-20931] 13 p0094 N77-11201
- The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling**  
14 p0242 N77-21621
- Hydrogen storage, water electrolysis and fuel cells for electric energy storage**  
[BNL-21498] 15 p0344 N77-22620
- STRIFLER, P.**  
Hybrid propulsion systems for electric road vehicles for short range public passenger transport test and operational experience - Prospects  
14 p0159 A77-22881
- STRIKHA, I. I.**  
Formation of sulfuric anhydride and nitrogen oxides in boilers at variable operating modes  
15 p0272 A77-33174
- STROEV, V. A.**  
An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system  
16 p0437 A77-47752
- STRONBERG, R. P.**  
Distribution of direct and total solar radiation availabilities for the USA  
16 p0471 A77-48926
- STRONG, A. E.**  
Use of Landsat data for the detection of marine oil slicks  
15 p0267 A77-32244
- STUBKIER, B.**  
Solar-powered refrigeration by intermittent solid absorption systems  
13 p0078 A77-19106
- STUCKENBRUCK, L. C.**  
Recovery of energy from solid waste - An answer to some of Southern California's problems  
14 p0182 A77-26078
- STUCKEY, D. C.**  
Heat treatment of refuse for increasing anaerobic biodegradability  
[PB-252924/6] 13 p0101 N77-11577
- STUDER, P. A.**  
Flywheel energy storage. II - Magnetically suspended superflywheel  
15 p0323 A77-39315
- STUBERKE, C.**  
Investigation of GaAs solar cell potential performance and cost  
[AD-A040736] 16 p0553 N77-33614
- STULC, P.**  
Heat pipes for the temperature range from 200 to 600 C  
13 p0119 N77-14381
- Heat pipes with a non-condensable gas and their application in nuclear apparatus and instruments**  
13 p0120 N77-14387
- STYLES, A. C.**  
Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation  
15 p0288 A77-33838
- STYRIKOVICH, N. A.**  
Place and role of various energy resources in energetics of the future  
15 p0261 A77-31468
- STYRIS, D. L.**  
Solar pond stability experiments  
16 p0482 A77-49028
- STYS, Z. S.**  
Compressed air storage for load leveling of nuclear power plants  
16 p0459 A77-48826
- SU, T. T.**  
The intersectoral feedback model  
[PB-255859/1] 13 p0125 N77-14950
- SUAI, J. C.**  
Efficiency of photovoltaic cells employing Schottky diodes  
14 p0151 A77-21815
- SUAI, J.-C.**  
An electrooptical model for the design of semiconductor solar cells  
16 p0429 A77-46469
- SUBBOTIN, V. I.**  
Some features of start-up of alkali metal heat pipes  
13 p0119 N77-14383
- SUBOTOWICZ, M.**  
Satellite solar power stations and energy relay satellites  
13 p0052 A77-14901
- On the active and passive CETI from earth satellite orbit**  
[IAP PAPER A-77-48] 16 p0507 A77-51524
- SUBRAMANIAN, T. K.**  
Winkler technology for clean fuels from coal  
15 p0301 A77-36337
- SUCIU, E. O.**  
Potential aerodynamic analysis of horizontal-axis windmills  
[AIAA PAPER 77-132] 14 p0135 A77-19848
- Two general methods for the unsteady aerodynamic analysis of horizontal-axis windmills**  
16 p0467 A77-48896
- SUDAR, S.**  
Electric vehicle performance with alternate batteries  
13 p0025 A77-12707
- Development status of lithium-silicon/iron sulfide load leveling batteries**  
16 p0448 A77-48741
- SUDNORTH, J. L.**  
Sodium/sulphur battery development in the United Kingdom  
13 p0026 A77-12717
- SUELAU, H. J.**  
Development of a low temperature phase change material package  
[AIAA PAPER 77-762] 15 p0325 A77-39514
- SUHAY, R.**  
ERDA/Lewis research center photovoltaic systems test facility  
[NASA-TN-X-73641] 15 p0343 N77-22609
- SUKHIA, S. P.**  
Design considerations for capillary heat pipes at cryogenic temperatures  
[ORNL-MIT-28] 15 p0361 N77-24430
- SUKHUJA, R.**  
A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries  
[PB-255658/7] 13 p0115 N77-13542

- A study of implant electric power generation in the chemical, petroleum refining, and paper and pulp industries  
[PB-255659/5] 13 p0115 N77-13543
- SULLIVAN, J. L.  
A feasibility study of bio-gas production in individual farms in Southwestern Ontario  
16 p0489 A77-49082
- SULLIVAN, T. J.  
Status report: Lawrence Livermore Laboratory wind energy studies  
[UCID-17157-1] 14 p0221 N77-19588
- SULLIVAN, T. L.  
Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator  
[NASA-TM-73718] 16 p0529 N77-30611
- SULLIVAN, W. G.  
Process energy reliability requirements for selected industries  
[ORNL-TM-5428] 15 p0364 N77-24594
- SULLIVAN, W. W.  
Engineering development status of the Darrieus wind turbine  
14 p0166 A77-23365
- SULZBERGER, V. T.  
The potential for application of energy storage capacity on electric utility systems in the United States. I  
13 p0054 A77-15625
- An off-peak energy storage concept for electric utilities. I - Electric utility requirements  
16 p0499 A77-49348
- SUMMERFIELD, H.  
Coal particle integrity in high-temperature solvents, with and without agitation  
16 p0401 A77-41317
- SUMMERS, R. A.  
Assessment of satellite power stations  
[AIAA PAPER 77-552] 15 p0266 A77-32069
- Prospects for satellite power stations  
[AAS 76-058] 16 p0430 A77-46639
- SUN, C.-H.  
Operational chemical storage cycles for utilization of solar energy to produce heat or electric power  
14 p0158 A77-22646
- SUPERCHYZNSKI, H. J.  
Superconducting machinery for Naval ship propulsion  
14 p0144 A77-21361
- SUPRONENKO, H. B.  
A 2-MW electric arc generator with porous cooling of the interelectrode insert  
13 p0049 A77-13831
- SUSSMAN, D.  
'Co-disposal' for solid wastes and sewage sludge  
16 p0427 A77-45873
- Energy from solid waste utilization; Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, University of Rhode Island, Kingston, R.I., July 8, 9, 1975  
16 p0433 A77-47210
- SUTER, P.  
Energy considerations related to the acquisition, supply, and utilization of solar energy  
14 p0203 A77-29572
- SUTHERLAND, R. I.  
Advanced fuel nuclear reaction feasibility using laser compression. II  
16 p0435 A77-47359
- SUTTON, R. C.  
Innovative Aircraft Design Study (IADS) task 2, volume 1  
[AD-A041234] 16 p0531 N77-31141
- SUTTOR, K.-H.  
Solar energy in tropical and subtropical countries  
16 p0421 A77-44449
- SUUBERG, E. M.  
Basic studies of coal pyrolysis and hydrogasification  
[PB-254878/2] 13 p0096 N77-11511
- SVATA, H.  
Influence of bonding and filling agents on the activity of tungsten carbide hydrogen electrodes  
15 p0260 A77-31173
- SVERDRUP, E. F.  
Advanced coal gasification system for electric power generation  
[FE-1514-176] 13 p0088 N77-10653
- SWALLON, D. W.  
Design, construction, and testing of a compact, lightweight combustion driven MHD generator channel and diffuser  
15 p0326 A77-39532
- SWAMY, C. N. N.  
Development of a vertical axis wind turbine (phase 1)  
[BHFT-FB-T-76-55] 14 p0209 N77-17112
- SWANNACK, C. E.  
Progress in switching technology for METS systems  
15 p0303 A77-36377
- SWANSON, R. K.  
Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
13 p0043 A77-12867
- Large windpower systems integrated with existing electric utilities  
16 p0490 A77-49094
- Development of an assessment methodology for geopressured zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in South Texas  
[COO-2687-4] 14 p0215 N77-18564
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility  
[CONP-760906-8] 14 p0222 N77-19609
- Development of an assessment methodology for geopressurized zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in south Texas  
[COO-2687-5] 15 p0361 N77-24571
- SWANSON, S.  
On evaluating the energy capacity and lifetime of fracture dominated geothermal reservoirs  
16 p0454 A77-48796
- SWANSON, S. R.  
Experimental measurements and system implications of the performance of flat plate solar collector configurations  
[ASME PAPER 76-WA/SOL-14] 14 p0189 A77-26519
- Calculation of long term solar collector heating system performance  
15 p0255 A77-30311
- SWAROOP, R.  
Ceramic coatings for components exposed to coal-gas environments: A review  
[ANL-76-124] 16 p0532 N77-31323
- SWARTMAN, H. K.  
Survey of absorption refrigeration systems  
13 p0078 A77-19105
- Solar retrofit of a home in Granton, Ontario  
16 p0479 A77-48995
- Solar energy and urban settlements  
16 p0494 A77-49127
- Solar air conditioning applications for warm humid climate  
16 p0496 A77-49147
- SWARTZ, B. A.  
Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator  
16 p0418 A77-43070
- SWARTZ, G. A.  
High level concentration of sunlight on silicon solar cells  
15 p0267 A77-32208
- SWATTON, S.  
Advanced helicopter structural design investigation. Volume 1: Investigation of advanced structural component design concepts  
[AD-A024662] 13 p0102 N77-12052
- SWEENEY, J. L.  
Economics of depletable resources: Market forces and intertemporal bias  
[PB-255623/1] 13 p0111 N77-12930
- SWEET, E.  
The use of functionalized polymers as photosensitizers in an energy storage reaction  
16 p0501 A77-50208

- SWEETE, L.**  
Study of corrosion and its control in aluminum solar collectors  
[COO-2934-76-1] 15 p0383 N77-26673
- SWENSON, P. F.**  
Development of the High Seasonal Performance Factor Gas Heat Pump 16 p0448 A77-48744
- SWERDLING, B.**  
Solar assisted heat pump demonstration project, phase 1  
[PB-259289/7] 14 p0217 N77-18589
- SWERDLING, M.**  
Solar thermionic power systems for terrestrial applications 16 p0466 A77-48893
- SWET, C. J.**  
Thermal storage for electric utilities  
[AIAA 77-1009] 16 p0403 A77-41556  
Turntable solar arrays 16 p0483 A77-49033
- SWIFT-HOOK, D. T.**  
The atmosphere and the oceans as energy sources 13 p0005 A77-11036
- SWIFT, R.**  
A cylindrical blackbody solar energy receiver 13 p0018 A77-12404
- SWIFT, W.**  
Reducing the environmental impact of solid wastes from a fluidized-bed combustor 16 p0454 A77-48790
- SWINEHART, R. M.**  
Transport theory of 3M high-performance thermoelectric materials 13 p0042 A77-12848
- SWINK, D. G.**  
Conceptual study for total utilization of an intermediate temperature geothermal resource  
[ANCR-1260] 14 p0211 N77-17579
- SWISHER, J. H.**  
Potential structural material problems in a hydrogen energy system 15 p0281 A77-33389  
ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- SWITZER, D.**  
The production and refining of crude oil into military fuels  
[AD-A024652] 13 p0095 N77-11207
- SVOPE, D. R.**  
A guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines 13 p0033 A77-12779  
Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396  
Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 N77-21634  
Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines  
[TREE-1036] 16 p0511 N77-28324
- SWOTINSKY, J. H.**  
Technologies lead to conservation 15 p0305 A77-36634
- SYMONS, P. C.**  
Evaluation of a 1 kWh zinc chloride battery system  
[PB-260683/8] 14 p0236 N77-21356
- SYRED, W.**  
Turbulent flow structures and recirculation patterns associated with cyclone combustors and their effect on flame stabilisation 15 p0288 A77-33838
- SZEGO, G. C.**  
The photosynthesis energy factory - Analysis, synthesis, and demonstration 16 p0449 A77-48753  
Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations  
[AD-A031163] 14 p0226 N77-19662  
Feasibility of meeting the energy needs of Army bases with self-generated fuels derived from solar energy plantations. Appendixes A, B, and C  
[AD-A031164] 14 p0226 N77-19663
- SZEGO, J.**  
Transient behavior of solid sensible heat thermal storage units for solar energy systems 13 p0057 A77-16208
- SZELESS, A.**  
Energy investment in nuclear and solar power plants 15 p0257 A77-30599
- SZEPRESSY, L.**  
Efficient sprayed In2O3:Sn n-type silicon heterojunction solar cell 16 p0503 A77-50292
- SZILAS, A. P.**  
Flow in geothermal hot water wells 14 p0163 A77-23037  
Interaction of hot water reservoirs and deep wells 14 p0163 A77-23038
- SZOSTAK, R. M.**  
Resource recovery technology for urban decision-makers  
[PB-252458/5] 13 p0093 N77-10964
- SZULMAYER, W.**  
Stationary solar concentrators for industrial heating and cooling 13 p0074 A77-19069
- T**
- TABACZYNSKI, R. J.**  
Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory  
[PB-262980/6] 15 p0356 N77-23619
- TABACZYNSKI, R. J.**  
Performance and NOx emissions modeling of a jet ignition prechamber stratified charge engine  
[SAE PAPER 760161] 13 p0016 A77-12150
- TABE, P.**  
Solar high technology and architecture 16 p0495 A77-49129
- TABET, D.**  
Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10090] 14 p0214 N77-18511
- TABOR, E.**  
A note of the economics of deep cylindrical mirror concentrating collectors 16 p0502 A77-50218
- TAGGER, S.**  
The ecology of a marine littoral receiving effluents from a petroleum refinery 16 p0433 A77-47113
- TANNER, E. H. Z.**  
Applied research on II-VI compound  
[PB-254637/2] 13 p0098 N77-11547
- TAKAGI, M.**  
Solar space heating and cooling with Bi-heat source heat pump and hot water supply system 14 p0158 A77-22643
- TAKETANI, H.**  
Some material considerations involved in the application of solar energy to electric power generation 13 p0049 A77-13739
- TAKEUCHI, M.**  
Energy conversion and storage by CDE /concentration difference energy/ engine and system 16 p0459 A77-48831
- TALAAT, M. E.**  
A pressurized liquid concept for solar-thermal energy storage for the 24-hour continuous operation of an energy conversion system  
[ASME PAPER 76-WA/HT-38] 14 p0187 A77-26484
- TALIB, A.**  
Energy transmission from ocean thermal energy conversion plants 13 p0032 A77-12773  
Ocean thermal energy delivery systems based on chemical energy carriers 15 p0279 A77-33375  
Ocean thermal energy delivery systems based on chemical energy carriers 14 p0240 A77-21609
- TALL, W. A.**  
Potential improvements in engine performance using a variable geometry turbine 15 p0340 A77-22141

- TAMAI, Y.**  
Gasification of coals treated with non-aqueous solvents. I - Liquid ammonia treatment of a bituminous coal  
14 p0198 A77-28778
- TAMBLYN, R. T.**  
Thermal storage - A sleeping giant  
15 p0304 A77-36427  
Thermal storage - It saves and saves and saves  
16 p0415 A77-42741
- TANUTUS, D.**  
High level concentration of sunlight on silicon solar cells  
15 p0267 A77-32208
- TAN, S. K.**  
Preliminary work on photovoltaic solar electric generator for rural electrification at Universiti Sains Malaysia  
14 p0153 A77-21840
- TAN, W. P. S.**  
Muon catalysed fusion for pellet ignition  
13 p0012 A77-11468
- TANABE, L. B.**  
Determination of SO<sub>2</sub> concentrations from a coal-burning power plant stack by Fourier spectrometry  
15 p0296 A77-36024
- TANAKA, T.**  
A terrestrial solar thermal electric power system - Development of basic model system  
16 p0422 A77-44478  
Fundamental studies on heat storage of solar energy  
16 p0423 A77-44490  
MIS silicon solar cells with In<sub>2</sub>O<sub>3</sub> antireflective coating  
16 p0499 A77-49494
- TANI, T.**  
A terrestrial solar thermal electric power system - Development of basic model system  
16 p0422 A77-44478  
Fundamental studies on heat storage of solar energy  
16 p0423 A77-44490
- TARASIUK, V. A.**  
Acoustic properties of subsonic MHD channel  
13 p0054 A77-15668
- TARDIFF, G. E.**  
Using Salton Sea Geothermal brines for electrical power: A review of progress in chemistry and materials technology - 1976 Status  
16 p0469 A77-48908
- TARHAN, P. B.**  
Hydrogen production by the steam-iron process  
13 p0023 A77-12688  
Hydrocarbon fuels from oil shale  
13 p0023 A77-12692  
Hydrogasification of oil shale  
14 p0169 A77-23556
- TARNOVE, T. L.**  
Infrared extinction spectra of some common liquid aerosols  
15 p0290 A77-34561
- TARREE, A.**  
Mechanisms of coal particle dissolution  
13 p0059 A77-16475
- TARRH, J. M.**  
A large conventional MHD magnet  
16 p0503 A77-50433
- TARRICONE, L.**  
Preparation and characteristics of CuGaSe<sub>2</sub>/CdS solar cells  
13 p0069 A77-18517
- TARTARELLI, E.**  
Catalytic action of combustion-product deposits in the oxidation of SO<sub>2</sub> to SO<sub>3</sub> within the combustion chambers and exhaust channels of thermoelectric plants  
16 p0420 A77-44179
- TARUD, F. J.**  
A comparative study of the effectiveness of baseboard convectors versus forced air solar heating at the University of Florida Solar House  
14 p0182 A77-26058
- TASHENEV, S. ZH.**  
Method of accounting for the ambiguity of initial information in the optimization of regional fuel/energy balance  
13 p0020 A77-12657
- TATE, E.**  
MHD generator investigations  
[AD-A032790] 15 p0358 A77-23952
- TATON, J. W.**  
Clean fuels from agricultural and forestry wastes  
[PB-259956/1] 14 p0233 A77-20610
- TAUBE, M.**  
Energy storage in the form of latent heat  
14 p0157 A77-22350
- TAUBENFELD, H. J.**  
Barriers to the use of wind energy machines: The present legal/regulatory regime and a preliminary assessment of some legal/political/societal problems  
[PB-263576/1] 15 p0366 A77-24620
- TAUBENFELD, H. F.**  
Barriers to the use of wind energy machines: The present legal/regulatory regime and a preliminary assessment of some legal/political/societal problems  
[PB-263576/1] 15 p0366 A77-24620
- TAUFIK, M. A.**  
An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system  
16 p0437 A77-47752
- TAUSWORTHE, R. C.**  
Phase conjugation method and apparatus for an active retrodirective antenna array  
[NASA-CASE-WFO-13641-1] 15 p0360 A77-24340
- TAYLOR, C. S.**  
An inflatable solar concentrator for a high temperature storage system  
13 p0074 A77-19064
- TAYLOR, H.**  
The storability of Li/SO<sub>2</sub> cells  
16 p0447 A77-48730
- TAYLOR, H. E.**  
The performance of homemade solar collectors at the Stockton State College 'Energy House'  
16 p0497 A77-49151
- TAYLOR, K.**  
The influence of subsurface energy storage on seasonal temperature variations  
13 p0067 A77-18351
- TAYLOR, L. D.**  
Residential demand for energy, volume 1  
[EPRI-EA-235-VOL-1] 16 p0530 A77-30629
- TAYLOR, L., JR.**  
Mechanisms of coal particle dissolution  
13 p0059 A77-16475
- TAYLOR, W. E.**  
Demonstration of the feasibility of automated silicon solar cell fabrication  
[NASA-CN-135095] 13 p0129 A77-15492
- TAYLOR, W. F.**  
A preliminary engineering assessment of jet fuel production from domestic coal and shale derived oils  
13 p0023 A77-12690  
Development of high stability fuel. Executive summary  
[AD-A039977] 16 p0533 A77-31339
- TCHERNEV, D. I.**  
Exploration of molecular sieve zeolites for the cooling of building with solar energy  
[PB-266055/3] 16 p0517 A77-28620
- TCHULKOV, B. A.**  
Some features of start-up of alkali metal heat pipes  
13 p0119 A77-14383
- TEAGAN, W. F.**  
Solar thermal power generation  
13 p0077 A77-19095
- TEARE, J. D.**  
Molecular gas performance of a disk generator with swirl  
15 p0326 A77-39534  
Environmental assessment of advanced energy conversion technologies  
16 p0452 A77-48778
- TECKCHANDANI, L.**  
Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir  
[PB-261562/3] 14 p0252 A77-21726
- TEPLE, R. V.**  
Preliminary economic analysis - Oil and power by COED-based coal conversion  
15 p0301 A77-36338

- TEGGERS, H.**  
Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors  
14 p0175 A77-24210
- Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors  
[INIS-MF-1965]  
13 p0084 A77-10228
- TELEGIN, E. E.**  
Investigation of the mechanism of cleaning heating surfaces by the pulsatic method  
[BIL-M-2544E-(5828.4F)]  
13 p0112 A77-13235
- TELEGIN, G. P.**  
Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility  
14 p0139 A77-21215
- The second joint test of a U.S. electrode system in the U.S.S.R. U-02 facility  
15 p0327 A77-39540
- TELKES, M.**  
Thermal storage in metals  
16 p0492 A77-49105
- TELL, B.**  
Photovoltaic properties and junction formation in CuInSe<sub>2</sub>  
15 p0305 A77-36584
- TEMPLEMEYER, K. E.**  
Investigation of direct coal-fired MHD power generation  
13 p0034 A77-12783
- Recent experimental studies of the interaction of potassium seed with coal slag in a direct-coal fired MHD generator  
14 p0141 A77-21250
- Investigation of factors influencing potassium seed recovery in a direct coal-fired generator system  
15 p0331 A77-39570
- A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- TENNER, L. I.**  
International law and the use of outer space for the production of solar power  
[IAP PAPER SL-77-62]  
16 p0508 A77-51565
- TENNERTY, V. J.**  
Impact of alternate fuels on industrial refractories and refractory insulation applications: An assessment  
[ORNL-TM-5592]  
15 p0344 A77-22618
- TENNEY, F. H.**  
Tokamak hybrid study  
[PPPL-1284]  
15 p0358 A77-23942
- TENO, J.**  
Explosively driven MHD generator power systems for pulse power applications  
15 p0299 A77-36300
- TEPLIAKOV, D. I.**  
Problems of energy storage in solar power stations  
13 p0063 A77-17555
- Tower-type solar energy plant - Configuration and energy efficiency of concentrator  
14 p0143 A77-21314
- Utilization of solar radiation in large solar power plants with hydraulic storage  
14 p0152 A77-21827
- Thermal optimization of steam generating systems for tower type solar steam power plants - Tasks and methods  
14 p0152 A77-21830
- Solar energy systems of the tower type - Arrangement and heat-stability of the receivers and steam generators  
15 p0316 A77-37770
- A tower-type solar power plant - Configuration and thermal-regime stability of receivers and steam generators  
16 p0437 A77-47426
- TEPLINSKII, G. I.**  
The relation between isotopic composition of argon and carbon in natural gases  
[NASA-TM-75134]  
16 p0531 A77-30680
- TERAKAWA, K.**  
Solar space heating and cooling with Bi-heat source heat pump and hot water supply system  
14 p0158 A77-22643
- TEREKHIN, V.**  
High-voltage photoelectric converters operating at high intensities of solar flux  
14 p0154 A77-21851
- TEREKHOVSKII, B. I.**  
Increasing the electrical strength of the interelectrode gap in an MHD generator  
16 p0428 A77-46091
- TEREKOV, A. IA.**  
Energy output and service life characteristics of high-voltage low-temperature thermopiles  
16 p0442 A77-48517
- TERICHOV, O. M.**  
Factors influencing the economics of large-scale in situ coal gasification operations  
15 p0306 A77-36765
- TESCHE, T. W.**  
Theoretical, numerical, and physical techniques for characterizing power plant plumes  
[PB-253099/6]  
13 p0101 A77-11599
- TESSEMER, R. G., JR.**  
The 1985 technical coefficients for inputs to energy technologies  
[BNL-50532]  
14 p0231 A77-20583
- Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil  
[BNL-50538]  
15 p0369 A77-24998
- Effects of alternative oil stockpiling programs on the US economy, 1976-1979  
[BNL-50541]  
15 p0369 A77-24999
- Input-Output capital coefficients for energy technologies  
[BNL-50608]  
16 p0524 A77-30027
- TESTER, J. W.**  
Geothermal energy as a source of electric power: Thermodynamic and economic design criteria  
13 p0060 A77-16623
- Energy extraction characteristics of hot dry rock geothermal systems  
16 p0455 A77-48798
- Geothermal energy for power generation  
[LA-UR-76-369]  
13 p0087 A77-10650
- Geothermal energy for electrical and nonelectrical applications  
[LA-UR-76-418]  
13 p0123 A77-14601
- Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672]  
14 p0221 A77-19597
- LASL hot dry rock geothermal project  
[LA-6525-PR]  
15 p0372 A77-25639
- TEVEROVSKII, E. M.**  
Relative hazard of nuclear power stations and fossil-fuel power stations to the environment  
13 p0067 A77-18323
- TEW, R. C., JR.**  
Analysis of regenerated single-shaft ceramic gas-turbine engines and resulting fuel economy in a compact car  
[NASA-TM-X-3531]  
16 p0521 A77-29607
- TEWARI, S. K.**  
Wind power for India  
16 p0423 A77-44498
- THACKSTON, B. L.**  
Predicting the rate of warming of rivers below hydroelectric installations  
16 p0437 A77-47749
- THALLER, L. E.**  
Electrically rechargeable REDOX flow cell  
[NASA-CASE-LEW-12220-1]  
13 p0121 A77-14581
- THEILSIEFJE, K.**  
Model formulations for development planning of energy systems  
14 p0191 A77-27036
- THEIS, T. L.**  
Contamination of groundwater by heavy metals from the land disposal of fly ash  
[COO-2727-4]  
15 p0357 A77-23631
- TEREKAKABA, M. P.**  
Survey of quantitative data on the solar energy and its spectra distribution  
13 p0072 A77-19044
- Insolation data for solar energy conversion derived from satellite measurements of earth radiance  
16 p0471 A77-48930
- Experimental and theoretical studies on solar energy for energy conversion  
16 p0471 A77-48932



- THEODORE, L.**  
Energy and the environment; Proceedings of the  
Third National Conference, Oxford, Ohio,  
September 29-October 1, 1975 15 p0291 A77-35146
- THEOBERT, A.**  
Fuel cells - Prospects of their applications for  
electric utilities 14 p0165 A77-23306
- THIEL, F. A.**  
N-indium tin oxide/p-indium phosphide solar cells  
15 p0317 A77-38049
- THIBLE, R. J.**  
Space construction base support requirements for  
environmental control and life support systems  
[ASME PAPER 77-ENAS-44] 16 p0432 A77-46885
- THODOS, G.**  
Liquid fuels and chemical feedstocks from coal by  
supercritical gas extraction 16 p0429 A77-46449
- THORNEN, K. H.**  
Energy recovery by the incineration of solid waste  
- Development, present status and experiences in  
Germany 15 p0334 A77-39675
- THOMAE, I. H.**  
Microcomputer processor for monitoring of solar  
heated buildings 16 p0481 A77-49015
- THOMAS, A. P.**  
Experimental and theoretical studies on solar  
energy for energy conversion 16 p0471 A77-48932
- THOMAS, C. O.**  
Methanol from coal fuel and other applications  
[ORAU-126] 13 p0094 A77-11200
- THOMAS, G.**  
Cuprous oxide Schottky photovoltaic cells as  
potential solar energy converters 13 p0076 A77-19088
- THOMAS, J.**  
Domestic and world trends (1980 - 2000) affecting  
the future of aviation  
[NASA-CR-144838] 13 p0126 A77-14981
- THOMAS, R.**  
Design considerations for a noncircular Tokamak  
demonstration plant  
[GA-A-14074] 15 p0351 A77-22968
- THOMASSEN, K. I.**  
Pulsed energy and switching requirements for  
Tokamak ohmic heating  
[LA-UR-76-2473] 15 p0397 A77-27932
- THOMX, R. J.**  
Superconducting magnets for an MHD test facility  
and base load power plant 14 p0144 A77-21379
- Design study of superconducting magnets for a  
combustion magnetohydrodynamic (MHD) generator  
[NASA-CR-135178] 14 p0234 A77-20886
- THOMPSON, A. W.**  
Selection of structural materials for hydrogen  
pipelines and storage vessels 15 p0281 A77-33390
- Selection of structural materials for hydrogen  
pipelines and storage vessels 14 p0243 A77-21625
- THOMPSON, D. E. F.**  
Solar retrofit of a home in Granton, Ontario  
16 p0479 A77-48995
- THOMPSON, K. C.**  
Transport theory of 3M high-performance  
thermoelectric materials 13 p0042 A77-12848
- THOMPSON, P. D.**  
Corrosion problems in solar energy systems  
15 p0270 A77-32603
- THOMPSON, P. W.**  
Underground gasification of coal: A National Coal  
Board reappraisal. 1976 13 p0044 A77-12926
- THOMPSON, S. J.**  
Transport theory of 3M high-performance  
thermoelectric materials 13 p0042 A77-12848
- THOMPSON, T. W.**  
Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 3: Reservoir  
Research and Technology  
[CONF-760222-P3] 14 p0249 A77-21678
- THOMPSON, W. G.**  
Intensity effects in SnO<sub>2</sub>-Si heterojunction solar  
cells 15 p0259 A77-30736
- THOMSON, J., JR.**  
Solar conversion efficiency of pressure sintered  
cadmium selenide liquid junction cells 15 p0320 A77-38367
- THOMSON, W.**  
Electric vehicle performance with alternate  
batteries 13 p0025 A77-12707
- THOMSON, W. B.**  
Uranium zirconium hydride reactor space power  
systems  
[IAF PAPER 76-256] 13 p0004 A77-10953
- Central station solar electric power using liquid  
metal heat transport 13 p0037 A77-12806
- Design of sodium-cooled, central receiver solar  
power plant 16 p0461 A77-48843
- THOMSON, W. J.**  
Gas-solid heat transfer coefficients in beds of  
crushed oil shale 14 p0196 A77-28472
- THOMSON, W. T.**  
Whirl stability of the pendulously supported  
flywheel system  
[ASME PAPER 77-APM-20] 15 p0323 A77-38837
- THOREN, T. E.**  
A new maintenance concept applied in the design of  
a new industrial gas turbine in the 100 MW class  
16 p0429 A77-46410
- THORNHILL, J. W.**  
Advanced high efficiency wraparound contact solar  
cell  
[AIAA PAPER 77-521] 14 p0174 A77-23934
- Demonstration of the feasibility of automated  
silicon solar cell fabrication  
[NASA-CR-135095] 13 p0129 A77-15492
- Automated fabrication of back surface field  
silicon solar cells with screen printed  
wraparound contacts  
[NASA-CR-135202] 16 p0546 A77-32590
- THORPE, D. G.**  
Anik B, the new Canadian domestic satellite  
16 p0499 A77-49249
- THORPE, R. W.**  
Factors in the planning of a national information  
system for renewable energy  
[PB-262003/7] 15 p0358 A77-24002
- THOUVENIN, MR.**  
Study of a heliostat system for a solar thermal  
converter with an energy of 10 MW 14 p0150 A77-21811
- THRESHER, R. W.**  
Design consideration for the Darrieus rotor  
13 p0044 A77-12872
- THROW, R. E.**  
Destroying chemical wastes in commercial scale  
incinerators. Facility report no. 2, Surface  
Combustion Division, Midland-Ross Corporation  
[PB-268232/6] 16 p0542 A77-32051
- THULLEN, P.**  
Thermal performance of the rotor of the MIT-EPRI 3  
MVA superconducting alternator 14 p0144 A77-21384
- THUPVONGSA, C.**  
Investigation of counterflow shear effects in heat  
pipes  
[AIAA PAPER 77-749] 15 p0311 A77-37262
- TJEBURG, R.**  
Heterostructures for silicon solar cells  
14 p0151 A77-21817
- TIKHONOV, B. A.**  
Experimental study of accelerating MHD-generator  
jets with supersonic flow distortion 15 p0269 A77-32519
- TIKHONOV, A. S.**  
Study of the electrical characteristics of the  
boundary layer on the metal surfaces in the  
channels of an open cycle MHD generator  
13 p0054 A77-15666
- Cathode spots on metallic electrodes of an  
MHD-channel 15 p0269 A77-32518

- TIKOLSKII, A. S.**  
Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the OO2 facility MHD generator  
15 p0329 A77-39554
- TILLER, J. S.**  
Regression study of solar radiation and electrical energy consumption  
14 p0137 A77-20686
- TILLIETTE, Z. P.**  
Description, output and development prospects of a 750 C helium direct cycle nuclear power plant with a single turbomachine and intermediate cooling  
[ASME PAPER 77-GT-2]  
14 p0197 A77-28522
- TIMBERS, G. B.**  
Recent Canadian activities in biomass  
16 p0470 A77-48917
- TIMMERHAUS, K. D.**  
Cryogenic Engineering Conference, Queen's University, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings  
16 p0410 A77-42151  
Economic aspects of U.S. energy independence in the coming decade  
16 p0411 A77-42165
- TIMMERMAN, D. H.**  
Vibration characteristics of a large wind turbine tower on non-rigid foundations  
[NASA-TN-X-73670]  
15 p0378 N77-26613
- TIMOURIAN, H.**  
Biosolar production of fuels from algae  
[UCRL-52177]  
16 p0511 N77-28323
- TING, P.**  
The fuel efficiency potential of a flywheel hybrid vehicle for urban driving  
13 p0020 A77-12664
- TINKLE, H. C.**  
Synthetic fuels from solid wastes and solar energy  
15 p0275 A77-33336  
Synthetic fuels from solid wastes and solar energy  
14 p0237 N77-21565
- TISCHLER, A. O.**  
Near-term chemically-propelled space transport systems  
15 p0295 A77-35810
- TISON, R. B.**  
A farm energy system employing hydrogen storage  
15 p0278 A77-33366  
Wind-powered hydrogen electric systems for farm and rural use  
[PB-259316/4]  
14 p0226 N77-19667  
A farm energy system employing hydrogen storage  
14 p0239 N77-21600
- TITLOW, E. I.**  
Energy and resource recovery from solid wastes  
16 p0434 A77-47215
- TITLOW, E. T.**  
The Garrett oil-from-waste process and resource recovery system  
15 p0293 A77-35162
- TITZE, I. R.**  
Solar-powered housing unit - Simulation of solar heating and cooling in Saudi Arabia  
13 p0078 A77-19110
- TLBHAT, R. W.**  
A proposed method of rating the thermal performance of solar collectors  
16 p0473 A77-48946
- TOFFOLO, W.**  
Superconducting induction coil for a doublet Tokamak experimental fusion power reactor  
14 p0144 A77-21376
- TOLA, G.**  
Design and testing of planar solar collectors  
14 p0164 A77-23298
- TOLBERT, W. A.**  
A status report on the USAFA solar energy program  
16 p0478 A77-48993  
Solar heating retrofit of military family housing  
[AD-A030843]  
14 p0226 N77-19659
- TOLIVER, C.**  
Space solar power systems  
14 p0213 N77-17690
- TOLLE, D. A.**  
Evaluation of the potential environmental effects of wind energy system development  
[ERDA/RSP-07378/75/1]  
15 p0382 N77-26663
- TOLLS, H. E.**  
The seat belt light is on  
13 p0080 A77-19175
- TOMAZIC, W. A.**  
Ceramic applications in the advanced Stirling automotive engine  
[NASA-TN-X-73632]  
15 p0354 N77-23487
- TOMBS, A. S.**  
Effects of thermal pollution on certain aquatic invertebrates  
[PB-263488/9]  
15 p0368 N77-24673
- TOMITA, A.**  
Differential scanning calorimetry studies on coal. II - Hydrogenation of coals  
13 p0070 A77-18583  
Reactivity heat-treated coals in hydrogen  
14 p0198 A77-28777
- TOMKINS, P. S.**  
Measurements of Sc I gf-values  
13 p0058 A77-16270
- TOMKOW, K.**  
Multi-stage activation of brown-coal chars with oxygen  
16 p0401 A77-41319
- TOMLINSON, G.**  
Energy fact book 1975. Parts 1-5: Appendixes A-H  
[AD-A023010]  
13 p0089 N77-10664
- TOMS, R. S. H.**  
The ERDA geothermal program  
14 p0177 A77-24603
- TONELLI, A. D.**  
Design and analysis of a 5000-MW GaAlAs satellite power system  
16 p0464 A77-48871
- TONELLI, A. H.**  
Computing residuals in geothermal research by I.R. scanning  
16 p0431 A77-46768
- TONET, S.**  
Metallurgical evaluation of materials for geothermal power plant applications  
16 p0499 A77-49700
- TONG, G.**  
Resource recovery technology for urban decision-makers  
[PB-252458/5]  
13 p0093 N77-10964
- TOOMRE, J.**  
Geophysical fluid dynamics background for ocean thermal power plants  
[DSE/1005-1]  
16 p0555 N77-33624
- TOPURILIA, I. I.**  
The analysis of the temperature regimes of the operation of a gas-regulated heat pipe  
13 p0064 A77-17924
- TORKELSON, L. E.**  
Solar total energy program  
[SAND-76-0205]  
14 p0211 N77-17571
- TORKILDSSEN, R. A.**  
Development of fuel cell CO detection instruments for use in a mine atmosphere  
[PB-254823/8]  
13 p0095 N77-11380
- TORO, R. F.**  
Thermal processing of municipal solid waste for resource and energy recovery  
16 p0438 A77-47951
- TORRENTI, R.**  
Energy budget for the year-round solar collector/storage system of a housing cluster situated in northern France  
16 p0417 A77-42963
- TORRES, P.**  
Hybrid drive with kinetic energy store as vehicle drive  
[UCRL-TRANS-11018]  
13 p0120 N77-14486
- TOSH, J. D.**  
Performance of Army engines with unleaded gasoline-field study evaluation  
[AD-A032075]  
15 p0342 N77-22490
- TOTH, G. W.**  
Availability of potential coal supply through 1985 by quality characteristics  
[PB-256680/0]  
13 p0121 N77-14573

- TOUCHAIS, H.**  
The two enemies of industrial development of solar energy - Simplicity and economy 13 p0078 A77-19109
- TOUFAR, W.**  
Mathematical simulation of the fixed-bed pressurized gasification process 14 p0164 A77-23097
- TOURE, I.**  
Thermodynamics and thermokinetics of a flat plate solar collector with constant heat capacity 13 p0073 A77-19057
- TOURIN, R. H.**  
A unitized 500-megawatt fluidized bed boiler design 16 p0453 A77-48786
- TOWER, L.**  
Two-phase working fluids for the temperature range 100-350 C  
[AIAA PAPER 77-753] 15 p0312 A77-37266
- TOWER, L. K.**  
Re-entrant groove heat pipe  
[AIAA PAPER 77-773] 15 p0312 A77-37280
- TOWLES, P. H.**  
Analysis of the sun pumped laser cone optics  
[AD-A034284] 15 p0361 N77-24483
- TOWNES, B. W.**  
An economic evaluation of small-scale wind powered electric generation systems  
[ASME PAPER 76-WA/ENER-1] 14 p0185 A77-26430
- TOWNSEND, W. G.**  
Cast polycrystalline silicon Schottky-barrier solar cells 16 p0503 A77-50295
- TOWSE, D. F.**  
Geology and potential uses of the geopressure resources of the Gulf Coast  
[UCID-17163] 14 p0215 N77-18562
- TRACEY, T. R.**  
One MW/th/ bench model cavity receiver steam generator 14 p0158 A77-22642  
1 MWth solar cavity steam generator solar test program 16 p0461 A77-48846
- TRAORE, C.**  
The role of solar energy in developing nations - The perspectives in Mali 13 p0080 A77-19125
- TRASK, A.**  
10 design principles for air-to-air heat pumps 16 p0408 A77-41824
- TRAYSER, D. A.**  
Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere  
[PB-253375/0] 13 p0092 N77-10715
- TREBUELL, G. W.**  
Design considerations for parabolic-cylindrical solar collectors 16 p0473 A77-48950  
Solar total energy program  
[SAND-76-0205] 14 p0211 N77-17571
- TREBLE, P. C.**  
Performance rating of photovoltaic solar generators for terrestrial applications 14 p0153 A77-21837  
Recommendations for the performance rating of flat plate terrestrial photovoltaic solar panels 16 p0527 N77-30539
- TREPILOV, V. I.**  
Studies of technological processes by solar energy under cosmic simulated conditions  
[IAF PAPER 77-54] 16 p0506 A77-51411
- TREGLIO, J. B.**  
Design considerations for a magma advanced fuel fusion reactor 15 p0334 A77-39747  
Conditions for a boron fusion reactor in the MeV range 16 p0436 A77-47366
- TRESTER, P. W.**  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 16 p0457 A77-48812  
An assessment of the materials needs for a Kr-85 fuel capsule 16 p0462 A77-48855
- TRILLING, C. A.**  
Low-Btu gasification of coal by Atomics International's molten salt process 13 p0023 A77-12687
- TRIMMER, D. S.**  
Development of a jet pump-assisted arterial heat pipe  
[NASA-CR-152015] 16 p0527 N77-30415
- TRINDADE, S. C.**  
Cassava fuel alcohol in Brazil 16 p0444 A77-48707
- TRIVICH, D.**  
Cuprous oxide Schottky photovoltaic cells as potential solar energy converters 13 p0076 A77-19088
- TROIA, S. O.**  
Thin film solar acceptors 13 p0072 A77-19053
- TROIANO, A. B.**  
Materials research and evaluation for geothermal corrosion environments  
[COO-2602-2] 14 p0210 N77-17216  
Hydrogen sulfide stress corrosion cracking in materials for geothermal power  
[COO-2576-3] 16 p0519 N77-29269
- TROMBE, F.**  
The French CNRS 1000 kW solar furnace - Description, performance characteristics, present utilization, and perspectives 15 p0262 A77-31473
- TROVILLION, T. A.**  
Two-phase Hartmann flows in the MHD generator configuration  
[AD-A036452] 16 p0518 N77-28948
- TROILER, R. W.**  
Predicting the rate of warming of rivers below hydroelectric installations 16 p0437 A77-47749
- TRUETT, J. B.**  
EPA and ERDA high-temperature/high-pressure particulate control programs  
[PB-266231/0] 16 p0517 N77-28644
- TRUKHOV, V. S.**  
Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up 13 p0051 A77-14580  
Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant 15 p0291 A77-34974  
Procedure for calculating thermocompressor thermodynamical parameters 16 p0442 A77-48519
- TRUSCELLO, V. C.**  
Solar thermal electric power plants - Their performance characteristics and total social costs 13 p0037 A77-12804  
Test and evaluation of the Navy half-watt RTG 13 p0042 A77-12853
- TSABOS, C. L.**  
The manufacture of hydrogen from coal 15 p0275 A77-33337  
The manufacture of hydrogen from coal 14 p0237 N77-21566
- TSCHIRWITZ, U.**  
On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells 16 p0425 A77-45151  
Investigation of acid-resistant electrocatalysts for fuel cells  
[NASA-TT-F-17367] 14 p0207 N77-16444
- TSENG, W.**  
CdS/Cu<sub>2</sub>S solar cells - A low-cost thin film polycrystalline photovoltaic device for terrestrial applications 16 p0486 A77-49059
- TSITELAURI, N. N.**  
Thermodynamic analysis of the formation of the oxides of nitrogen and sulfur in fuel combustion products 15 p0269 A77-32506
- TSIVINSKY, A. I.**  
Advanced fuel nuclear reaction feasibility using laser compression. II 16 p0435 A77-47359

- TSOU, P.-K.  
Solid waste incineration and energy recovery in hospitals  
15 p0272 A77-33283
- TSOUKALAS, T. C.  
Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle  
[AD-A026321]  
13 p0124 A77-14607
- TSU, T. C.  
ECAS MHD system studies  
14 p0142 A77-21268
- TSUCHIYA, E.  
A study of the effects of new transportation systems on urban transportation and environment by computer simulation  
16 p0430 A77-46652
- TSUJI, T.  
Absorption of sulfur dioxide into aqueous sodium hydroxide and sodium sulfite solutions  
16 p0412 A77-42407
- TSYRULNIKOV, A. S.  
Liquid flow pattern in extraction of geothermal energy  
14 p0135 A77-19706
- TUCKER, W. K.  
PULSAR, an unconventional topping stage  
13 p0034 A77-12788  
Pulsed energy conversion with a dc superconducting magnet  
13 p0081 A77-19293  
PULSAR - A flux compression stage for coal-fired power plants  
14 p0190 A77-26544
- TUKHMEZ, E.  
International energy evaluation system  
15 p0319 A77-38216
- TUKHTASINOV, I.  
Thermoelectric power of pseudoternary solid solutions  
13 p0014 A77-11917
- TUMANOVSII, A. G.  
Testing the annular combustor of the NK-8 aero-engine on natural gas  
16 p0426 A77-45325
- TUNG, S. E.  
Environmental assessment of advanced energy conversion technologies  
16 p0452 A77-48778
- TURCHI, P.  
A multi-megajoule inertial-inductive energy storage system  
15 p0299 A77-36292
- TURGEON, A.  
Optimal unit commitment  
15 p0260 A77-30812
- TURNAGE, J. C.  
Management analysis of nuclear allocation for the generation of electricity  
16 p0413 A77-42590
- TURNBULL, P. G.  
Advanced motor developments for electric vehicles  
15 p0305 A77-36615  
Flywheel module for electric vehicle regenerative braking  
16 p0447 A77-48728
- TURNER, A. H.  
Energy saving potential of engine-electric vehicular drives  
13 p0025 A77-12708
- TURNER, G. S.  
Some considerations in determining oxides of nitrogen in stack gases by chemiluminescence analyzer  
13 p0062 A77-17541
- TURNER, L. E.  
Electric vehicle research, development, and technology, foreign  
[AD-A040526]  
16 p0542 A77-32034
- TURNER, E. D.  
Superconducting energy storage development for electric utility systems  
[LA-UR-76-2294]  
15 p0381 A77-26649
- TURNER, E. E.  
Oil and gas use characterization, impacts, and guidelines  
[PB-265267/5]  
16 p0516 A77-28610
- TURNER, E. H.  
Economic optimization of the energy transport component of a large distributed solar power plant  
13 p0037 A77-12807  
Thermal energy storage using large hollow steel ingots  
16 p0492 A77-49106
- TURNQUIST, D. V.  
Repetitive series Interrupter II  
[AD-A035267]  
15 p0371 A77-25447
- TURNQUIST, E. A.  
Wind-powered hydrogen electric systems for farm and rural use  
[PB-259318/4]  
14 p0226 A77-19667
- TURSUBBARY, I. A.  
Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up  
13 p0051 A77-14580  
Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant  
15 p0291 A77-34974
- TWEEDIE, A. T.  
Two component thermal energy storage material  
[PB-252592/1]  
13 p0090 A77-10675
- TYLER, J. R.  
The industrial gas turbine - Its status and prospects  
16 p0429 A77-46408
- TYSON, T. J.  
Environmental aspects of low Btu gas combustion  
16 p0440 A77-48178
- U**
- UBHAYAKAR, S. K.  
Applications of the rapid devolatilization of coal in MHD power cycles  
14 p0141 A77-21249  
Devolatilization of pulverized coal during rapid heating  
15 p0331 A77-39566  
Ignition and combustion behavior of pulverized coal jets in hot oxidizing atmospheres  
15 p0331 A77-39568  
Modelling of entrained-bed pulverized coal gasifiers  
16 p0401 A77-41321  
Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers  
[WSS/CI PAPER 76-25]  
16 p0419 A77-43593
- UCAR, E.  
Thermal simulation of a building with solar assisted closed liquid loop unitary heat pumps  
[ASHE PAPER 76-WA/SOL-23]  
14 p0190 A77-26528  
Commercial building unitary heat pump system with solar heating  
[PB-255488/9]  
13 p0099 A77-11551
- UDAGAWA, E.  
Design and construction of solar space heating and hot water supply systems for experimental multi-family housing  
16 p0477 A77-48979
- UDANI, L. H.  
A new concept for the manufacture of low sulfur fuels and chemicals from coal  
14 p0192 A77-27295
- UEHARA, A.  
A study of the effects of new transportation systems on urban transportation and environment by computer simulation  
16 p0430 A77-46652
- UESAKI, T.  
Cooling subsystem design in CSU Solar House III  
16 p0475 A77-48964  
Cooling subsystem design in CSU solar house 3  
[COO-2858-1]  
16 p0514 A77-28592
- UGLOV, A. A.  
Energy conditions of welding with solar radiation  
16 p0421 A77-44274
- ULANOV, G. E.  
Automatic optimization of operating modes in thermionic electrical power generators  
[IAP PAPER 77-142]  
16 p0507 A77-51445
- ULBRICH, E. A.  
Application of a shunt motor and a 2 cylinder gasoline engine as a hybrid drive for an automobile  
13 p0025 A77-12703

- ULLMAN, A. Z.  
Methods of on-board generation of hydrogen for vehicular use 15 p0280 A77-33383  
Methods of on-board generation of hydrogen for vehicular use 14 p0242 N77-21617
- UMAROV, G. IA.  
Radiant-vector distribution in the radiant field of a parabolocylindric concentrator 13 p0015 A77-11920  
Thermodynamic analysis and selection of optimal parameters of a dynamic converter for a solar energy set-up 13 p0051 A77-14580  
A Cassegrain system for solar radiation 13 p0063 A77-17561  
Thermodynamic analysis and choice of optimal parameters of dynamic converter for solar energy plant 15 p0291 A77-34974  
Development and testing of solar water-heating boilers manufactured by diffusion welding 15 p0316 A77-37773  
Development and testing of solar water-heater boilers fabricated by diffusion welding 16 p0437 A77-47429
- UNOTO, J.  
Two-dimensional analysis of end effects in diagonal type nonequilibrium plasma MHD generator 15 p0297 A77-36097
- UNDERHILL, G.  
Preliminary analysis of electric generation utilizing geopressured geothermal fluids 13 p0030 A77-12752
- UNDERHILL, G. K.  
Proceedings of Second Geopressured Geothermal Energy Conference. Volume 4: Surface technology and resource utilization [CONF-760222-P4] 14 p0248 N77-21675
- UNKEL, W.  
Axial field limitations in MHD generators 15 p0328 A77-39552
- UNNEWEHR, L. E.  
Energy saving potential of engine-electric vehicular drives 13 p0025 A77-12708
- UNNY, T. E.  
Studies on methods of reducing heat losses from flat plate solar collectors [COO-2597-2] 15 p0395 N77-27554
- UNO, F. M.  
Advanced high efficiency wraparound contact solar cell [AIAA PAPER 77-521] 14 p0174 A77-23934
- UOSAKI, K.  
The theory of hydrogen production in a photoelectrochemical cell 13 p0075 A77-19075  
The theory of hydrogen production in a photoelectrochemical cell 15 p0279 A77-33370  
Cathodes for photodriven hydrogen generators - ZnTe and CdTe 15 p0296 A77-35921  
Theoretical treatment of the photoelectrochemical production of hydrogen 15 p0321 A77-38530  
The theory of hydrogen production in a photoelectrochemical cell 14 p0239 N77-21604
- UPDIKE, W. A.  
Influence of coal type and drying upon MHD power plants and components 14 p0140 A77-21231
- UPHALIS, A.  
The overcoming of energy deficiencies with the aid of wind power 13 p0008 A77-11174
- URBACH, H. B.  
Aluminum-based anodes for underwater fuel cells: A phase report [AD-A026405] 13 p0131 N77-15512
- URE, R. W., JR.  
Thermionic emission characteristics of seeded coal slags 14 p0140 A77-21229
- URIELI, I.  
A new mathematical model for Stirling cycle machines 16 p0465 A77-48884  
A new ported constant volume external heat supply regenerative cycle 16 p0465 A77-48885
- URY, H.  
A multi-megajoule inertial-inductive energy storage system 15 p0299 A77-36292
- USOWICZ, J.  
On the active and passive CETI from earth satellite orbit [IAF PAPER A-77-48] 16 p0507 A77-51524
- USPENSKAYA, G. L.  
Study of the maximum Hall voltages and interelectrode breakdown in the channel of an open-cycle MHD generator - A joint U.S.-U.S.S.R. experiment on the UO2 facility MHD generator 15 p0329 A77-39554

## V

- VACHON, B. I.  
Diversification as an energy conservation strategy 13 p0027 A77-12725
- VACOBY, H. D.  
Federal support for the development of alternative automotive power systems: The general issue and the Stirling, diesel, and electric cases [PB-263523/3] 15 p0354 N77-23518
- VAIDYANATHAN, P. P.  
Tidal power generation in India 15 p0310 A77-36988
- VAIL, C. W.  
Design, operation and economics of the energy plantation 15 p0315 A77-37667  
Solid fuels from biomass - Some environmental and economic considerations 16 p0445 A77-48712  
The photosynthesis energy factory - Analysis, synthesis, and demonstration 16 p0449 A77-48753  
Design, operation and economics of the Energy Plantation 16 p0497 A77-49154
- VAINER, A. A.  
Paraboloid-hyperboloid concentrating systems and their accuracy 15 p0286 A77-33433  
Paraboloid-hyperboloid concentrating systems and their accuracy 16 p0427 A77-45546
- VAKHIDOV, A. T.  
Study of an absorption solar refrigeration unit functioning on a round-the-clock basis 15 p0316 A77-37772  
Investigation of solar absorption cooler for round-the-clock operation 16 p0437 A77-47428
- VAKIL, H. B.  
Design analyses of a methane-based chemical heat pipe 13 p0028 A77-12737
- VALDANIS, IA. IA.  
Analogy between thermal-convective and magnetohydrodynamic instabilities 16 p0425 A77-44690
- VALENTINE, P.  
Energy technologies for the West: General Session, volume 2 [TID-27427] 16 p0538 N77-31646
- VALERIOTE, E. M. L.  
A computer program to calculate and plot wind-generated stored energy at constant consumption [AD-A029977] 15 p0356 N77-23613
- VALETTE, L.  
Analysis of a Delphi study on hydrogen 15 p0284 A77-33411  
Analysis of a Delphi study on hydrogen 14 p0246 N77-21649
- VALETTE, P.  
Analysis of a Delphi study on hydrogen 15 p0284 A77-33411  
Analysis of a Delphi study on hydrogen 14 p0246 N77-21649

- VALKO, P.  
Meteorological data regarding the utilization of solar energy 14 p0202 A77-29563
- VAN DEELEN, W.  
Hydrogen in the energy system of the Netherlands 15 p0285 A77-33420
- VAN DER LEIJ, H.  
Influence of the direct spectral solar energy distribution on the normal total absorptivity of spectral selective surfaces 16 p0502 A77-50219
- VAN DOREN, T. P.  
On the analysis and design of grid structures for p-n junction solar cells 16 p0497 A77-49156
- VAN GIESSEL, R.  
Design of the 4-215 D.A. automotive Stirling engine [SAE PAPER 770082] 16 p0424 A77-44560
- VAN HASSELT, H. C. H.  
Experiences with a 400 watt solar cell array in the Netherlands in the period December 1974-December 1975 14 p0154 A77-21850
- VAN HEER, K. H.  
A technical scale gas generator for steam gasification of coal using nuclear heat 16 p0502 A77-50255
- VAN HESSEN, P.  
The Osmotic power plant 13 p0021 A77-12668
- VAN HORN, A. J.  
Aspects of energy conversion: Proceedings of the Summer School, Lincoln College, Oxford, England, July 14-25, 1975 13 p0004 A77-11026
- VAN MEEL, J. J. B. A.  
Effects of wind fluctuations on windmill behaviour 16 p0410 A77-42073
- VAN OSDOL, J. H.  
Uranium zirconium hydride reactor space power systems [IAF PAPER 76-256] 13 p0004 A77-10953
- VAN VALIN, C. C.  
Atmospheric ice nuclei - No detectable effects from a coal-fired powerplant plume 13 p0054 A77-15780
- VAN VELZEN, D.  
Definition and analysis of thermochemical processes for hydrogen production based on iron-chlorine reactions 15 p0276 A77-33351
- VAN VORST, W. D.  
Methods of on-board generation of hydrogen for vehicular use 15 p0280 A77-33383  
Crash test of a liquid hydrogen automobile 15 p0282 A77-33397
- VAN VUCHT, J. H. W.  
Intermetallic compounds - Background and results of twenty years of research 13 p0014 A77-11600
- VAN WAKEREN, J. B. A.  
Waveguide high pass filter for thermal conversion of solar energy 13 p0073 A77-19054  
A geometrical spectral selective window 14 p0148 A77-21793
- VAN ZOLINGEN, B. J. C.  
Improving HIS silicon solar cells by HF-treatment of the insulating oxide layer 14 p0151 A77-21819
- VANABROUDE, J. C.  
Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses [NASA-CR-137924] 15 p0353 A77-23073
- VANARSDALE, E. T.  
Energy and US agriculture. 1974 data base, volume 1. Part A: US series of energy tables. Part B: State series of energy tables [PB-264449/0] 15 p0395 A77-27562
- VANCE, R. W.  
Applications of cryogenic technology. Volume 8 14 p0159 A77-22868
- VANDEELAN, W.  
Hydrogen in the energy system of The Netherlands 14 p0247 A77-21660
- VANDERPLAATS, G.  
Aerodynamic design of a conventional windmill using numerical optimization 14 p0199 A77-29070
- VANDERBYN, J.  
International cooperation on development of hydrogen technologies 14 p0171 A77-23717
- VANGYSEL, H.  
Solar heating for a sports complex in Belgium 16 p0417 A77-42958
- VANHETEREN, J. P. A.  
Hydrogen combustion. Part 1: Investigation of hydrogen flame control methods [CTI-IV-75-01449] 14 p0235 A77-21204
- VANKE, V. A.  
A microwave energy converter with a reversing magnetic field 14 p0139 A77-21154
- VANSANT, J. H.  
An experimental 200 kW vertical axis wind turbine for the Magdalen Islands 13 p0044 A77-12874
- VANT-HULL, L. L.  
Collector field optimization for a solar thermal electric power plant 13 p0038 A77-12811  
A new method for collector field optimization 13 p0074 A77-19070  
The economic collection and efficient utilization of solar energy 14 p0147 A77-21778  
The solar tower as a source of thermal electric energy 14 p0152 A77-21831  
Development of solar tower program in the United States 14 p0204 A77-29591  
An educated ray trace approach to solar tower optics 14 p0204 A77-29592  
Solar tower characteristics 15 p0274 A77-33333  
A solar flux density calculation for a solar tower concentrator using a two-dimensional Hermite function expansion 16 p0405 A77-41578  
Power with heliostats 16 p0433 A77-47174  
Methods for estimating total flux in the direct solar beam at any time 16 p0471 A77-48934  
Collector field design for a central receiver solar thermal power plant 16 p0484 A77-49039  
Reflection coefficient for a back-surface glass mirror 16 p0488 A77-49072  
Solar tower characteristics 14 p0237 A77-21562
- VANTINE, B. C.  
Methanol engine: A transportation strategy for the post-petroleum era [UCRL-52041] 14 p0219 A77-19469
- VANVORST, W. D.  
Methods of on-board generation of hydrogen for vehicular use 14 p0242 A77-21617  
Crash test of a liquid hydrogen automobile 14 p0244 A77-21635
- VANZELE, R.  
Regional economic impacts of nuclear power plants [BNL-50562] 16 p0540 A77-31676
- VARDE, K. S.  
Possible pollution and cost analysis from wide use of hydrogen fuel in transportation 15 p0285 A77-33422  
Hydrogen peroxide emission levels from a hydrogen fueled combustion engine 16 p0399 A77-40644  
Possible pollution and cost analysis from wide use of hydrogen fuel in transportation 14 p0247 A77-21664
- VARFOLOMEEV, S. D.  
Conversion of solar energy by photosynthetic production of molecular hydrogen 14 p0143 A77-21316

- VARNADO, S. G.  
An assessment of mechanical energy storage for solar systems  
16 p0460 A77-48839
- VARPETIAN, V. S.  
Research on battery-operated electric road vehicles  
14 p0146 A77-21701
- VARTANIAN, A. V.  
Design of a tracking system for a solar-energy installation  
13 p0015 A77-11919
- VASILESCU, C. A.  
Studies on realization of normal combustion of hydrogen in spark-ignition engines by reduction of temperature of residual burnt gases  
14 p0195 A77-28050
- VASILIEVA, I. A.  
Joint US-USSR experimental studies of the dependence of plasma electrical conductivity on plasma temperature performed in the Avco Mark VI MHD facility  
14 p0142 A77-21257
- VATAZHIN, A. B.  
Calculation of turbulent magnetohydrodynamic boundary layers in MHD generator channels  
13 p0046 A77-13242
- VATERKOWSKI, J. L.  
New modes of operation for avalanche diodes - Frequency multiplication and upconversion  
13 p0049 A77-14261
- VAUGHN, L.  
Implementation issues of wind energy [AIAA 77-1025]  
16 p0404 A77-41565
- VECCI, S. J.  
Investigating storage, handling, and combustion characteristics of solvent refined coal [PB-257557/9]  
14 p0212 N77-17595
- VEEPKIND, A.  
Experimental fluctuation analysis in a noble gas MHD generator  
15 p0326 A77-39535
- VELIKANOV, D. P.  
Transport of the future and the tasks of science  
13 p0048 A77-13643  
Problems of transportation power plants  
14 p0136 A77-20004
- VELIKHOV, E. P.  
The current state and prospects for development of controlled thermonuclear fusion  
14 p0157 A77-22537
- VELIOGLU, S. G.  
Water and energy systems - A planning model  
16 p0506 A77-51279  
Mathematical models for use in planning regional water resources and energy systems [PB-261364/4]  
15 p0352 N77-23022
- VENDURA, G.  
Improvement of the efficiency of M-S solar cells by interfacial modifications  
14 p0151 A77-21818
- VENIKOV, V. A.  
Allocation of standby power units in terms of the output power, in planning the development of power systems  
14 p0167 A77-23406  
An algorithm for solving the problem of the optimal control of transient processes in an electrical energy system  
16 p0437 A77-47752
- VENKATASETTI, B. V.  
Inorganic phase change materials for energy storage in solar thermal program  
16 p0492 A77-49103
- VENKATASETTI, B. V.  
Thermal energy storage for solar power plants  
13 p0027 A77-12731
- VENTURA, H.  
The Osmotic power plant  
13 p0021 A77-12668
- VERHOVEN, J.  
Waveguide high pass filter for thermal conversion of solar energy  
13 p0073 A77-19054  
A geometrical spectral selective window  
14 p0148 A77-21793
- VERLEGER, P. K., JR.  
Residential demand for energy, volume 1 [EPRI-BA-235-VOL-1]  
16 p0530 N77-30629
- VERMEULEN, P. J.  
Reduced drag, paraboloid type, solar energy collectors  
16 p0473 A77-48951
- VERMILYEA, D. A.  
Future trends in electrical energy generation economics in the United States  
15 p0317 A77-37960
- VERNON, S. H.  
Schottky solar cells on thin epitaxial silicon  
13 p0047 A77-13509  
Factors which maximize the efficiency of Cr-p-Si Schottky /MIS/ solar cells  
15 p0288 A77-34103
- VEROT, MR.  
Study of a heliostat system for a solar thermal converter with an energy of 10 MW  
14 p0150 A77-21811
- VEZIROGLU, T. N.  
Hydrogen production using solar radiation  
13 p0048 A77-13540  
Solar production of hydrogen as a means of storing solar energy  
13 p0075 A77-19072  
World Hydrogen Energy Conference, 1st, Miami Beach, Fla., March 1-3, 1976, Proceedings. Volumes 1, 2 & 3  
15 p0273 A77-33326  
Economics of nuclear-electrolytic hydrogen  
15 p0285 A77-33419  
First World Hydrogen Energy Conference proceedings, volume 1  
14 p0237 N77-21552  
First World Hydrogen Energy Conference proceedings, volume 2  
14 p0238 N77-21591  
First World Hydrogen Energy Conference proceedings, volume 3  
14 p0243 N77-21626
- VIALABET, G.  
Preliminary report on simulation of a heliostat field [ERDA-TR-158]  
14 p0226 N77-19782
- VIALARON, MR.  
Problems relating to heat storage  
14 p0152 A77-21826
- VIDALE, B.  
Geothermal chemistry activities at LASL [LA-6448-PR]  
15 p0344 N77-22623
- VIDOTSI, T.  
Mathematical method for determining reaction networks in chemical systems  
16 p0418 A77-43093
- VIDT, E. J.  
Advanced coal gasification system for electric power generation [FE-1514-176]  
13 p0088 N77-10653
- VIEHBOECK, F.  
Application of solar heat to buildings in Austria  
13 p0079 A77-19114
- VIELHABER, K.  
Heat pumps in solar installations  
15 p0337 A77-39987
- VILENSKII, V. D.  
Heat transfer and resistance in the flow of nonequilibrium dissociating nitrogen dioxide  
13 p0058 A77-16213
- VILICIC, I.  
Principles and systems for utilization of solar energy in heating and preparation of hot water  
15 p0255 A77-30257
- VILNITIS, A. IA.  
Internal problem for the end effect in a linear asynchronous MHD-machine operating at an arbitrary current load  
15 p0295 A77-35799
- VINZ, P.  
Development of a 10 kWe solar thermal power station  
14 p0154 A77-21844
- VIRANONTES, F. A.  
Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units  
13 p0096 N77-11525
- VIRON, I. IA.  
Solar heating in residential houses in Uzbekistan  
15 p0316 A77-37774  
Residential solar heating in Uzbekistan  
16 p0437 A77-47430

- VISENTIN, R.**  
Efficiency tests on a linear parabolic concentrator for medium and high temperatures  
13 p0077 A77-19103  
Simulation of the performance of a solar energy plant using uniaxial parabolic collectors, with a one-degree-of-freedom pointing system, at different latitudes  
14 p0164 A77-23297
- VISKANTA, R.**  
Comparison of long-term flat-plate solar collector performance calculations based on averaged meteorological data  
15 p0256 A77-30315  
Thermal analysis of some flat-plate solar collector designs for improving performance [AIAA PAPER 77-727]  
15 p0311 A77-37252  
Comparison of predicted performance of constant outlet temperature and constant mass flow rate collectors  
16 p0423 A77-44489
- VISSERS, D. B.**  
Performance characteristics of solid lithium-aluminum alloy electrodes  
13 p0007 A77-11107
- VITON, M.**  
Induction devices - A new type of magnetohydrodynamic converter  
14 p0198 A77-28786
- VITT, L. P.**  
Design modification of Pemco Model 702909 wireless ground monitor [PB-262858/4]  
15 p0360 A77-24371
- VITTITOE, C. N.**  
Mathematical modeling of solar concentrators  
16 p0473 A77-48949
- VITURBAU, P.**  
Thermal energy of oceans  
14 p0153 A77-21833
- VLAHAKIS, J.**  
Environmental assessment sampling and analytical strategy program [PB-261259/6]  
15 p0352 A77-23021
- VLASOV, D. S.**  
Increase in the efficiency of heat and power systems using large artificial accumulators of heat  
13 p0064 A77-17939
- VLASOV, V. N.**  
Optimization of current source operation in pulse mode [IAF PAPER 76-255]  
13 p0003 A77-10952
- VLCEK, M.**  
Contribution to the solution of planning problems in electric power generation /effects of random disturbances/  
15 p0294 A77-35399
- VLGGHEBT, J. P. K.**  
Fuel consumption of civil jet transport aircraft  
13 p0062 A77-17234
- VOELKEE, G. E.**  
Utilizing methane from coalbeds  
16 p0444 A77-48710  
Energy savings through on-site fuel cells in industrial applications  
16 p0449 A77-48752
- VOGEL, G. J.**  
Synthetic additives for SO<sub>2</sub> removal from combustion gas in a fluidized-bed coal combustor  
15 p0293 A77-35168  
Reducing the environmental impact of solid wastes from a fluidized-bed combustor  
16 p0454 A77-48790
- VOGEL, H. F.**  
Energy storage and transfer with monopolar machine for a linear theta-pinch hybrid reactor [LA-6174]  
14 p0214 A77-17892  
Pulsed energy and switching requirements for Tokamak ohmic heating [LA-UR-76-2473]  
15 p0397 A77-27932
- VOGENTHALER, T. J.**  
Energy research overview - Alternatives for energy development [AAS 75-280]  
15 p0304 A77-36555
- VOIGT, H.**  
Non-nuclear energy technology. Low temperature cable for power transmission [BNFT-PB-T-76-01]  
14 p0210 A77-17372
- VOLTZ, S. E.**  
Upgrading coal liquids to gas turbine fuels. I - Analytical characterization of coal liquids  
14 p0145 A77-21623  
Upgrading coal liquids to gas turbine fuels. II - Compatibility of coal liquids with petroleum fuels  
14 p0177 A77-24852  
Upgrading coal liquids to gas turbine fuels. III - Exploratory process studies  
14 p0178 A77-24853
- VON KOENIG, P.**  
Wind energy in practical use: Wheels, rotors, mills, wind power plants  
15 p0271 A77-33114
- VON PUTTKAMER, J.**  
The next 25 years: Industrialization of space - Rationale for planning  
15 p0322 A77-38792
- VON ROSENBERG, C. W., JR.**  
Devolatilization of pulverized coal during rapid heating  
15 p0331 A77-39566  
Diagnostics for thermal cracking of coal volatiles in entrained-bed gasifiers [WSS/CI PAPER 76-25]  
16 p0419 A77-43593
- VON STURN, F.**  
Titanium-containing Raney nickel catalyst for hydrogen electrodes in alkaline fuel cell systems  
13 p0064 A77-18019
- VON TIESENHAUSEN, G. F.**  
Photovoltaic and thermal energy conversion for solar powered satellites [IAF PAPER 76-117]  
13 p0003 A77-10913
- VONDRAK, R. B.**  
Environmental impact of space manufacturing [AIAA PAPER 77-539]  
15 p0266 A77-32062
- VONROSENBERG, C. W., JR.**  
Applications of the rapid devolatilization of coal in MHD power cycles  
14 p0141 A77-21249
- VOROBEV, V. S.**  
Some results of MHD-laser investigation  
15 p0328 A77-39549
- VOROBEVA, L. P.**  
Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels [BLL-M-25473-(5828.4F)]  
15 p0359 A77-24245
- VORRES, K. S.**  
HYGAS process update  
14 p0192 A77-27296
- VOSEBURGH, K. G.**  
Compressed air energy storage [AIAA 77-1008]  
16 p0403 A77-41555  
Compressed air energy storage for electric utility load leveling  
16 p0458 A77-48825
- VOSHALL, R. E.**  
Design of closed-cycle MHD generator with nonequilibrium ionization and system  
15 p0303 A77-36381
- VUK, M. M.**  
The spatial characteristics of three Wyoming fuels [AD-A030873]  
14 p0233 A77-20612
- VYAS, K. C.**  
Utilization of low and intermediate BTU gas from coal for iron ore pelletizing [PB-264702/2]  
15 p0389 A77-27247

## W

- WADDINGTON, D.**  
Calorimetry of large solar concentrators  
13 p0038 A77-12814
- WADE, B.**  
A solar home for low income families  
16 p0476 A77-48970  
The Lowell Observatory experimental solar heating module  
16 p0476 A77-48976  
A passive solar heated house - Design and construction  
16 p0478 A77-48989  
A retrofit solar heating system constructed with salvaged and readily available components designed for self-installation by low income families  
16 p0479 A77-48998



- WADE, H. A.  
The Crain solar house - A case study in the architectural and engineering design process as applied to solar housing for public sale  
16 p0496 A77-49140
- WADLE, R. C.  
Preliminary design study of a baseline MIUS  
[NASA-TN-X-58193]  
16 p0561 A77-34050
- WAGNER, C. E.  
Baseline gas turbine development program  
[COC-2749-15]  
15 p0390 A77-27410
- WAGNER, G. L.  
R&H - Today's heating and cooling vs. solar energy  
13 p0002 A77-10482
- WAGNER, H. F.  
Development of new technologies for energy production in the Federal Republic of Germany  
16 p0505 A77-51157
- WAGNER, H.-F.  
Energy supply of the Federal Republic of Germany  
16 p0419 A77-43566
- WAGNER, K. L.  
Fluidized bed heat exchangers for geothermal applications  
13 p0029 A77-12748
- WAGNER, L. H.  
Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 KW wind turbine tower  
[NASA-TN-X-73548]  
13 p0114 A77-13534
- WAGNER, E. D.  
Energy and economic trade offs for advanced technology subsonic aircraft  
14 p0201 A77-29471
- WAGNER, S.  
Preparation of CdS/InP solar cells by chemical vapor deposition of CdS  
14 p0205 A77-29893
- InP-CdS solar cells  
15 p0259 A77-30740
- H-CdS/n-GaAs voltage-enhanced photoanode  
16 p0503 A77-50287
- WAGONER, C. L.  
Investigating storage, handling, and combustion characteristics of solvent refined coal  
[PB-257557/9]  
14 p0212 A77-17595
- WAHLIG, R.  
Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures  
16 p0475 A77-48962
- Results from circumsolar radiation measurements  
[LBL-5292]  
15 p0382 A77-26657
- WAHLQUIST, E. J.  
Radioisotope power sources in the terrestrial and marine environment  
14 p0196 A77-28170
- WAIDE, C. H.  
Comparing the electric lead-acid battery vehicle with a hydrogen fueled vehicle incorporating an Fe-Ti hydride storage unit  
[BNL-20990]  
14 p0211 A77-17577
- WAKEFIELD, E. H.  
The consumer's electric car  
16 p0431 A77-46786
- WAKEFIELD, G. F.  
Large area Czochralski silicon for solar cells  
16 p0486 A77-49054
- WAKEHAM, S. G.  
A characterization of the sources of petroleum hydrocarbons in Lake Washington  
16 p0439 A77-48099
- WAKSHAN, D.  
Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
[PB-257770/8]  
14 p0208 A77-16452
- WALD, F. V.  
Enhancement of diffusion length in EFG ribbon solar cells under illumination  
16 p0503 A77-50293
- WALDMAN, B. H.  
Definition study for photovoltaic residential prototype system  
[NASA-CR-135056]  
13 p0113 A77-13533
- WALDRON, W. D.  
Underground coal mine instrumentation and test  
[NASA-CR-150045]  
16 p0551 A77-33479
- WALKER, G. W.  
Improved acid electrolytes for the hydrocarbon-air fuel cell  
14 p0195 A77-28166
- An improved electrolyte for direct oxidation fuel cells  
[AD-A026164]  
13 p0131 A77-15518
- WALKER, H. D.  
A study of the economic feasibility of a thermal energy storage system for solar heating applications using a PCM  
[ASME PAPER 76-WA/HT-63]  
14 p0187 A77-26490
- WALKER, F. L., JR.  
Differential scanning calorimetry studies on coal. II - Hydrogenation of coals  
13 p0070 A77-18583
- Reactivity heat-treated coals in hydrogen  
14 p0198 A77-28777
- Concurrent carbon gasification and carbon deposition in chars  
16 p0508 A77-51590
- WALKER, R. L.  
Progress of feasibility reassessment of exploiting Fundy tidal energy  
16 p0439 A77-47971
- WALKER, S. B.  
Aerodynamics of the Darrieus rotor  
13 p0050 A77-14559
- WALKER, W. L.  
Lightweight reflector assembly  
[NASA-CASE-NPO-13707-1]  
16 p0518 A77-28933
- WALL, J. C.  
Performance and NOx emissions modeling of a jet ignition prechamber stratified charge engine  
[SAE PAPER 760161]  
13 p0016 A77-12150
- WALL, T. F.  
Reaction rate analysis of borehole 'in-situ' gasification systems  
16 p0440 A77-48177
- WALLACE, R. W.  
Recommendations for a US geothermal research plan, volume 1  
[PB-261566/4]  
15 p0346 A77-22640
- Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2]  
15 p0346 A77-22641
- Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0]  
15 p0346 A77-22642
- Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8]  
15 p0346 A77-22643
- WALLIN, S. P.  
Preliminary design study of a baseline MIUS  
[NASA-TN-X-58193]  
16 p0561 A77-34050
- WALSLEY, R.  
Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames  
[PB-259911/6]  
14 p0234 A77-20639
- WALSH, P. W.  
Nuclear power - Compared to what  
13 p0017 A77-12234
- WALSH, T. F.  
The Riley-Morgan gasifier  
14 p0193 A77-27298
- WALSH, W. J.  
Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles  
[CONF-760617-3]  
16 p0535 A77-31618
- WALSTROM, P. L.  
Cryogenic instrumentation needs in the controlled thermonuclear research program  
[CONF-761007-1]  
14 p0219 A77-19406
- WALTER, D. K.  
Waste resources - Problems and promise  
[ASME PAPER 77-WAS-49]  
16 p0432 A77-46890
- WALTER, R. A.  
Economic optimization of binary fluid cycle power plants for geothermal systems  
13 p0029 A77-12744
- User manual for GEOCOST: A computer model for geothermal cost analysis. Volume 2: Binary cycle version  
[BNWL-1942-V2]  
15 p0345 A77-22632
- Optimization technique for geothermal power plants using a binary fluid cycle  
[BNWL-2155]  
15 p0394 A77-27546

- Modeling and optimization of geothermal power plants using the binary fluid cycle [BNWL-2112] 16 p0521 N77-29609
- WALTER, W. T.  
Heat-pipe bismuth laser; examination of laser action at 4722 Å in bismuth vapor [AD-A035568] 16 p0533 N77-31495
- WALTERS, A. B.  
Technical and environmental aspects of underground hydrogen storage 15 p0279 A77-33379  
Technical and environmental aspects of underground hydrogen storage 14 p0242 N77-21613
- WALTON, B. L.  
Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary [PB-255994/6] 13 p0107 N77-12533  
Impacts of synthetic liquid fuel development. Automotive market. Volume 2 [PB-255995/3] 13 p0108 N77-12534  
Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262512/7] 15 p0361 N77-24504  
Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system [PB-262513/5] 15 p0361 N77-24505
- WALTON, G.  
Interim feasibility assessment method for solar heating and cooling of Army buildings [AD-A026588] 13 p0124 N77-14606  
Market evaluation study: Solar domestic water heaters for DOD barracks [AD-A036479] 16 p0516 N77-28611
- WALTON, G. N.  
Method for estimating solar heating and cooling system performance 14 p0170 A77-23653  
Method for estimating solar heating and cooling system performance [AD-A026041] 13 p0116 N77-13557  
Predicting the performance of solar energy systems [AD-A035608] 15 p0373 N77-25660
- WALTON, J. D.  
One MW/th/ bench model cavity receiver steam generator 14 p0158 A77-22642
- WALTON, J. D., JR.  
Georgia Tech 400 KWth solar thermal test facility 16 p0498 A77-49158  
Georgia Tech high temperature solar test facility 16 p0500 A77-49745
- WALTON, R. G.  
Electric power development in the Pacific Northwest Region: Institutional commitments and alternatives, phase 1 [PB-262382/5] 15 p0348 N77-22671
- WALTROP, P. J.  
Direct-connect tests of hydrogen-fueled supersonic combustors 16 p0440 A77-48240
- WALTZ, J. P.  
District heating with refuse derived fuel at Wright-Patterson Air Force Base 15 p0293 A77-35164
- WALZEL, M. D.  
A solar flux density calculation for a solar tower concentrator using a two-dimensional Bernite function expansion 16 p0405 A77-41578
- WALZER, P.  
High-temperature ceramics for automobile gas turbines. II 13 p0063 A77-17591  
Development of a turbine rotor of silicon nitride 16 p0503 A77-50651
- WANG, E. Y.  
An analysis of silicon solar cell parameters for terrestrial applications 13 p0076 A77-19081  
Cuprous oxide Schottky photovoltaic cells as potential solar energy converters 13 p0076 A77-19088
- WANG, K. L.  
Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game [PB-255607/4] 13 p0105 N77-12502
- WARNER, J.-C.  
Air transportation and fuel consumption 13 p0051 A77-14563
- WANTROBA, A.  
Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812
- WARABISAKO, T.  
Fabrication and characterization of thin-film silicon solar cells on alumina ceramic 15 p0258 A77-30732
- WARD, D. S.  
Preliminary performance of CSU Solar House I heating and cooling system 14 p0158 A77-22644  
Operational modes of solar heating and cooling systems 14 p0180 A77-25899  
Design of a solar heating and cooling system for CSU Solar House II 14 p0181 A77-25902  
Cooling subsystem design in CSU Solar House III 16 p0475 A77-48964  
Design, construction, and testing of a residential solar heating and cooling system [COO-2577-10] 14 p0248 N77-21670  
Cooling subsystem design in CSU solar house 3 [COO-2858-1] 16 p0514 N77-28592
- WARD, J. C.  
Operational modes of solar heating and cooling systems 14 p0180 A77-25899  
Minimum cost sizing of solar heating systems 16 p0480 A77-49010  
Evaluation of the solar heating system in the Lof residence, Denver, Colorado [PB-258845/7] 14 p0233 N77-20617
- WARD, R. F.  
Federal Fuels from Biomass Energy Program 15 p0315 A77-37670
- WARD, R. L.  
Biosolar production of fuels from algae [UCRL-52177] 16 p0511 N77-28323
- WARD, S. H.  
Dipole-dipole resistivity surveys, Roosevelt hot springs KGRA, volume 2 [PB-264897/0] 15 p0371 N77-25623
- WARD, W. J., III  
Progress on the selective removal of H<sub>2</sub>S from gasified coal using an immobilized liquid membrane 15 p0318 A77-38146
- WARDE, C. J.  
The Westinghouse Sulfur Cycle for the thermochemical decomposition of water 15 p0277 A77-33354  
The Westinghouse sulfur cycle for the thermochemical decomposition of water 14 p0238 N77-21587
- WARDROPER, A. H. K.  
Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra 15 p0260 A77-31262
- WARE, S. A.  
Fuel and energy production by bioconversion of waste materials: State-of-the-art [PB-258499/3] 14 p0219 N77-19279
- WARREN, J. C.  
Experimental study of the subsurface transport of water and heat as related to the storage of solar energy 16 p0493 A77-49112
- WARREN, J.  
Systems study of fuels from sugar cane, sweet sorghum, and sugar beets [TID-27032] 14 p0211 N77-17570
- WARREN, S. E.  
Battery-flywheel hybrid electric power system for near term application. Volume 2: System design [UCID-17098-VOL-2] 14 p0228 N77-20443

- WARWICK, W.  
A multi-megajoule inertial-inductive energy storage system 15 p0299 A77-36292
- WARNOCK, J. P., JR.  
Solar retrofit applications for public buildings 16 p0479 A77-48997
- WARREN, D. R.  
Hydrocarbon fuels from solar energy via the alga *Botryococcus brauni* [ARL/MECE-ENG-148] 16 p0513 N77-28576
- WARREN, B. W.  
Progress in switching technology for NETS systems 15 p0303 A77-36377
- WARSCHAUER, D. H.  
Status of the ERDA photovoltaic materials and device studies 16 p0486 A77-49056
- WARZINSKI, R. P.  
Chemical cleaning of coal [ASHE PAPER 76-WA/APC-2] 14 p0184 A77-26409
- WATANABE, M.  
Organic Rankine Cycle Engine development and solar energy utilization 13 p0077 A77-19096
- WATERLAND, L. R.  
Evaluation of molten scrubbing for fine particulate control [PB-266092/6] 16 p0517 N77-28642
- WATERMAN, W. W.  
Overview of energy supply and demand 15 p0313 A77-37653
- WATERS, E. D.  
Heat pipes for the trans-Alaska pipeline 13 p0120 N77-14388
- WATSON, W. I.  
Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment [PB-269270/5] 16 p0561 N77-34058
- WAYNE, L. G.  
Reliability study of vapor recovery systems at service stations [PB-267613/8] 16 p0560 N77-33700
- WEAVER, L. K.  
A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve [PB-255948/2] 13 p0105 N77-12500
- WEAVER, H. A., JR.  
BT-gas pilot plant processes 5 tph 16 p0441 A77-48478
- WEBB, K.  
Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work. Analysis of the Philadelphia-Lindenwold high-speed line [PB-263048/1] 15 p0370 N77-25014
- WEBER, B. A.  
Research and development assessment on safety and pollution control for outer continental shelf operations [AD-A034727] 15 p0357 N77-23635
- WEBER, W.  
The optimum configuration of rotor blades for horizontal wind energy converters [NASA-TT-F-17379] 14 p0210 N77-17562
- WEDDIGEN, G.  
Development of sodium/sulfur-cells 13 p0026 A77-12716  
Some studies on sodium/sulfur cells 13 p0055 A77-15813
- WEDEL, R. K.  
Use of Lexan and Kapton honeycombs to increase solar collector efficiency 13 p0068 A77-18448  
Development of plastic honeycomb flat-plate solar collectors [SAN/1081-76/1] 15 p0372 N77-25640
- WEERTMAN, J.  
Heat extraction from hot dry rock masses [PB-256775/8] 13 p0116 N77-13556  
Heat extraction from hot, dry rock masses [PB-265116/4] 16 p0516 N77-28609
- WEHLAGE, E. F.  
Geothermal heat - instead of electrically powered compression - proposed for cooling a small residence or office building 15 p0335 A77-39818
- WEHRLE, V. A.  
Thermal energy management techniques in spacecraft design and their potential for terrestrial applications 16 p0439 A77-47969
- WEI, G. C.  
Impact of alternate fuels on industrial refractories and refractory insulation applications: An assessment [ORNL-TM-5592] 15 p0344 N77-22618
- WEIBEL, L.  
Details of hydrogen-burning thermonuclear reactions 14 p0168 A77-23457
- WEIL, S. A.  
Hydrocarbon fuels from oil shale 13 p0023 A77-12692  
Hydrogasification of oil shale 14 p0169 A77-23556
- WEIN, D.  
Multipurpose insulation system for a radioisotope fueled Mini-Brayton Heat Source Assembly 13 p0022 A77-12678
- WEIN, W.  
Operating experience with the combined unit of the III/A central heating power plant of the Duisburg AG municipal utility 15 p0271 A77-32800
- WEINER, H.  
An assessment of wind-powered generators for navigational aids 16 p0468 A77-48900
- WEINGARTEN, L. I.  
Sandia vertical-axis wind turbine program [SAND-76-0338] 14 p0250 N77-21686
- WEINHOLD, J. F.  
IEA energy simulation model: A framework for long-range US energy analysis [ORAU-125] 13 p0122 N77-14594
- WEINSTEIN, A.  
Atlanta /Towns/ solar experiment - The lessons we learned 13 p0047 A77-13503  
Lessons learned from Atlanta /towns/ solar experiment 16 p0423 A77-44491  
Lessons learned from Atlanta /Towns/ solar experiment 16 p0476 A77-48971
- WEINSTEIN, W. J.  
Thermal processing of municipal solid waste for resource and energy recovery 16 p0438 A77-47951
- WEINZIERL, K.  
Improvements in energy conversion technology 16 p0505 A77-51154
- WEISS, R.  
Performance test of a bladeless turbine for geothermal applications [UCID-17068] 14 p0212 N77-17581
- WEISS, R. F.  
Production of atmospheric nitrous oxide by combustion 13 p0061 A77-16922
- WEISS, T. A.  
Preliminary performance of CSU Solar House I heating and cooling system 14 p0158 A77-22644  
Design application of the Hottel-Whillier-Bliss equation 15 p0255 A77-30309
- WEITZEL, D. H.  
Cryogenic Engineering Conference, Queen's University, Kingston, Ontario, Canada, July 22-25, 1975, Proceedings 16 p0410 A77-42151  
Economic aspects of U.S. energy independence in the coming decade 16 p0411 A77-42165
- WEITZMAN, L.  
Environmental and technical considerations concerning energy recovery from refuse combustion 15 p0292 A77-35157
- WEITZMAN, H. L.  
OPEC and the monopoly price of world oil (World Oil Project) [PB-265015/8] 16 p0518 N77-29001

- WEIZER, V. G.  
Consideration of design and calibration of  
terrestrial reference solar cells  
16 p0527 N77-30531
- WELDON, W. F.  
The design, fabrication and testing of a five  
megajoule monopolar actor-generation  
15 p0299 A77-36311  
Energy storage and transfer with homopolar machine  
for a linear theta-pinch hybrid reactor  
[LA-6174] 14 p0214 N77-17892
- WELLER, A. E.  
Combustion additives for pollution control: A  
state-of-the-art review  
[PB-264068/8] 15 p0359 N77-24316
- WELLER, S. W.  
Batch autoclave studies of catalytic  
hydrosulfurization of coal  
14 p0145 A77-21617
- WELLMAN, P.  
Oil shale development  
13 p0023 A77-12693
- WELSH, L. B.  
Optimization of PT-doped Kccite (trademark)  
electrodes in H3 PO4 fuel cells  
[AD-A025326] 13 p0107 N77-12529  
Optimization of platinum-doped Kocite electrodes in  
H3PO4 fuel cells  
[AD-A039242] 16 pC529 N77-30626
- WELTE, D.  
Development of a vertical axis wind turbine (phase  
1)  
[BMPT-PE-T-76-55] 14 p0209 N77-17112
- WEN, C. Y.  
Simulation of fluidized bed combustors. I -  
Combustion efficiency and temperature profile  
14 p0145 A77-21698
- WEN, L.  
Comparative performance of solar thermal power  
generation concepts  
13 p0036 A77-12803
- WENTINK, T., JR.  
Study of Alaskan wind power and its possible  
applications  
[NSF/BANN/SE/AER74-00239/PR-26] 15 p0382 N77-26664
- WENTWORTH, R. L.  
Fuel gas recovery from controlled landfilling of  
municipal wastes  
13 p0070 A77-18739
- WENTWORTH, W. E.  
Simple thermal decomposition reactions for storage  
of solar thermal energy  
15 p0292 A77-35153
- WENZEL, H.  
Physical metallurgy of FeTi-hydride and its  
behavior in a hydrogen storage container  
14 p0242 N77-21620
- WENZEL, J. G.  
OTEC - Aerospace and ocean engineering in  
partnership  
[AIAA PAPER 77-296] 13 p0066 A77-18227
- WERTH, J.  
Sodium chloride battery development program for  
load leveling  
[PB-257570/2] 14 p0208 N77-16456
- WERTWIJN, B.  
Thermostatics and thermokinetics of a flat plate  
solar collector with constant heat capacity  
13 p0073 A77-19057
- WESELY, H. L.  
A method for estimating hourly averages of diffuse  
and direct solar radiation under a layer of  
scattered clouds  
13 p0019 A77-12412
- WESSEBERG, D. L.  
PULSAR, an unconventional topping stage  
13 p0034 A77-12788  
Pulsed energy conversion with a dc superconducting  
magnet  
13 p0081 A77-19293  
PULSAR - A flux compression stage for coal-fired  
power plants  
14 p0190 A77-26544
- WEST, H. H.  
The use of mixture working fluids in geothermal  
binary power cycles  
16 p0455 A77-48802
- WEST, R. E.  
An engineering feasibility study of using low  
temperature geothermal sources in Colorado  
13 p0031 A77-12762
- WEST, T. H.  
Process energy reliability requirements for  
selected industries  
[ORNL-TM-5428] 15 p0364 A77-24594
- WESTBROOK, C. E.  
Methanol engine: A transportation strategy for  
the post-petroleum era  
[UCRL-52041] 14 p0219 N77-19469
- WESTLAKE, D. W. S.  
The origin of the oil sand bitumens of Alberta - A  
chemical and a microbiological simulation study  
16 p0438 A77-47765
- WESTMORELAND, P. R.  
Comparative kinetics of high-temperature reaction  
between H2S and selected metal oxides  
16 p0424 A77-44608
- WETH, G.  
Pressurized fluidized bed pilot plant for  
production of electric power using high sulfur  
coal  
16 p0453 A77-48782  
Coal fired combined cycle for electric power  
generation  
16 p0453 A77-48783
- WETZLER, E. S.  
Evaluation of rail rapid transit and express bus  
service in the urban commuter market  
[PB-265236/0] 15 p0398 N77-28046
- WEXLER, B. J.  
Regulatory reform of air transportation  
[AIAA PAPER 77-276] 13 p0065 A77-18215
- WEYANT, J. P.  
The potential role of technological modifications  
and alternative fuels in alleviating Air Force  
energy problems  
[AD-A039597] 16 p0525 N77-30261
- WHARTON, H. E.  
Study of the cost/benefit tradeoffs for reducing  
the energy consumption of the commercial air  
transportation system  
[NASA-CR-137927] 13 p0126 N77-15008
- WHARTON, L.  
On the use of solid-dielectric compound parabolic  
concentrators with photovoltaic devices  
16 p0488 A77-49073
- WHELAN, J. A.  
Thermal gradient and heat flow drilling, volume 5  
[PB-268422/3] 16 p0544 N77-32577
- WHELPDALE, D. H.  
Effects of anthropogenic emissions on climate - A  
review of selected topics  
13 p0067 A77-18295
- WHIELDON, C. E.  
Underground coal gasification - A status report  
16 p0441 A77-48473
- WHITACHE, W. E.  
Space-borne power conversion into a microwave beam  
and its impact on the environment of the upper  
atmosphere  
16 p0464 A77-48875
- WHITAKER, D. H.  
Progress in switching technology for NETS systems  
15 p0303 A77-36377
- WHITBECK, J. P.  
Making electricity from moderate temperature fluids  
13 p0002 A77-10649  
The economic generation of electricity from  
moderate temperature geothermal resources  
13 p0030 A77-12749  
Plan for developing moderate temperature/low  
salinity geothermal resources  
[ANCR-1318] 14 p0222 A77-19614
- WHITE, E. H.  
Preliminary design study of a baseline M10S  
[NASA-TN-X-58193] 16 p0561 A77-34050
- WHITE, P. E.  
Growth and characterization of thin-film compound  
semiconductor photovoltaic heterojunctions  
14 p0162 A77-22978
- WHITE, H. H.  
Research plan for achieving reduced automotive  
energy consumption  
[PB-255929/2] 13 p0121 N77-14495

- WHITE, L. G.  
Economic comparison of synthetic fuels -  
Gasification and liquefaction 15 p0300 A77-36329
- WHITE, L. B.  
Progress on the testing of refractories for  
directly-fired MHD air heater service. II 15 p0328 A77-39544
- WHITE, P. C.  
Fossil energy research and development in ERDA 13 p0063 A77-17551
- WHITE, S. S.  
Santa Clara, California, community center,  
commercial solar demonstration legal  
alternatives, implications, and financing of  
solar heating and cooling by a municipal  
corporation [SAN/1083-76/1] 15 p0394 A77-27549
- WHITE, W. H.  
The chemistry, dispersion, and transport of air  
pollutants emitted from fossil fuel power plants  
in California [PB-254449/2] 13 p0092 A77-10720
- WHITEFORD, J.  
Slag layers in direct coal-fired MHD power  
generation 14 p0139 A77-21224
- WHITELAW, B. L.  
Hydrogen-powered highway vehicles - Applications  
and optimum form of fuel storage 15 p0280 A77-33382
- Hydrogen-powered highway vehicles: Applications  
and optimum form of fuel storage 14 p0242 A77-21616
- WHITLOW, E. P.  
Relationship between heat source temperature, heat  
sink temperature and coefficient of performance  
for solar-powered absorption air conditioners 14 p0168 A77-23446
- WHITHORE, D. B.  
Basic research on ceramic materials for energy  
storage and conversion systems [COO-2564-2] 16 p0511 A77-28305
- WHITHORE, A. R.  
Advanced fuel fusion experimentation with  
Migmacells II and III - Orbit diagnostics and  
lifetime measurements 16 p0436 A77-47362
- Fusion products detection system in Migmacell II 16 p0436 A77-47363
- WHITTEN, G. E.  
Theoretical, numerical, and physical techniques  
for characterizing power plant plumes [PB-253099/6] 13 p0101 A77-11599
- WHITTLE, C. E.  
IEA energy simulation model: A framework for  
long-range US energy analysis [ORAU-125] 13 p0122 A77-14594
- WICHNER, B.  
Temperature dependence of the photovoltaic  
performance of Si cells under blue, white, and  
near-bandgap irradiation [UCRL-76203] 15 p0381 A77-26652
- WIDGER, W. K., JR.  
Estimating wind power feasibility 13 p0010 A77-11315
- New England wind power...coastal or mountain 13 p0058 A77-16250
- WIDNER, H.  
Combined gas/steam cycle power and heat generating  
plants 14 p0155 A77-22023
- WIDNER, T. F.  
Energy conservation and a healthy economy 15 p0305 A77-36612
- WIENER, A. J.  
Domestic and world trends (1980 - 2000) affecting  
the future of aviation [NASA-CR-144838] 13 p0126 A77-14981
- WIFFEN, R. D.  
Emission and deposition of petrol engine exhaust  
Pb. I - Deposition of exhaust Pb to plant and  
soil surfaces 15 p0333 A77-39655
- WIGGIN, E. A.  
Role of nuclear power in meeting future U.S.  
energy needs [IAEA-CN-36/396] 16 p0560 A77-33677
- WIHL, M.  
Energy requirement for the production of silicon  
solar arrays [NASA-CR-153409] 16 p0528 A77-30604
- WIIG, K. H.  
Outer continental shelf oil and gas costs and  
production volume: Their impact on the nation's  
energy balance to 1990 [PB-262533/3] 15 p0343 A77-22604
- WIJEYSUNDARA, N. E.  
Effect of angular misorientation on the  
performance of conical, spherical and parabolic  
solar concentrators 16 p0502 A77-50221
- WILBANKS, T. J.  
Our energy future: The role of research,  
development, and demonstration in reaching a  
national consensus on energy supply 14 p0179 A77-25224
- WILBUR, P. J.  
A comparison of solar absorption air conditioning  
systems 14 p0158 A77-22647
- WILCOX, K.  
Ecological considerations of the solar alternatives  
[LBL-5927] 16 p0558 A77-33655
- WILDE, F.  
Methods for geothermal reservoir detection  
emphasizing submerged environments [LBL-4495] 14 p0236 A77-21532
- WILDES, P. D.  
A multilayer iron-thionine photogalvanic cell 13 p0007 A77-11108
- The dependence of current output of the Ti-TL  
SnO<sub>2</sub>/Pt iron-thionine photogalvanic cell on  
photostationary state composition 16 p0502 A77-50220
- WILDIN, M. W.  
Experimental results for a heat pump system with  
thermal storage [COO-2704-3] 14 p0250 A77-21697
- WILKINSON, D. B.  
Development of a small, low cost turbojet engine  
with thrust augmentation 16 p0434 A77-47347
- WILL, F. G.  
The zinc-bromine battery - Possible candidate for  
electric vehicles and load leveling 16 p0446 A77-48725
- WILLARD, W. A.  
Prevention of Failures in Coal Conversion Systems:  
Proceedings of the 24th Meeting of the  
Mechanical Failures Prevention Group [PB-265552/0] 15 p0395 A77-27563
- WILLCUTT, G. J. E., JR.  
Simulation and cost optimization of solar heating  
of buildings in adverse solar regions 14 p0180 A77-25897
- WILLETT, D. C.  
Underground pumped storage research priorities  
[PB-254413/8] 13 p0089 A77-10667
- WILLIAMS, A.  
Ignition of droplets of liquid fuels solvent  
extracted from coal 16 p0508 A77-51588
- WILLIAMS, A. W.  
Compendium of critiques of JPL report SP-43-17:  
Automotive technology status and projections  
project [NASA-CR-155180] 16 p0552 A77-34519
- WILLIAMS, D. L.  
Submarine geothermal resources 13 p0010 A77-11322
- WILLIAMS, D. W.  
Bioconversion of agricultural wastes for pollution  
control and energy conservation [TID-27164] 15 p0383 A77-26675
- WILLIAMS, F.  
Underground gasification of coal: A National Coal  
Board reappraisal. 1976 13 p0044 A77-12926
- Methodology for ranking geothermal reservoirs in  
non-electric industrial applications [MTR-7241] 14 p0222 A77-19610
- WILLIAMS, J. C. E.  
The technology base for large MHD superconducting  
magnets 14 p0140 A77-21233

- WILLIAMS, J. D.**  
Multiparameter optimization studies on geothermal energy cycles  
16 p0456 A77-48804
- WILLIAMS, J. E.**  
A theory and experimental investigation of ducted wind turbines  
16 p0410 A77-42072
- WILLIAMS, J. E. C.**  
Superconducting magnet development for the MHD program  
15 p0331 A77-39569
- WILLIAMS, J. H.**  
Current status of the magnetic fusion program  
13 p0035 A77-12792  
Overview of the ERDA fusion power program  
13 p0068 A77-18446
- WILLIAMS, J. R.**  
Design and simulation studies for the Shenandoah Community Center large-scale solar cooling demonstration  
[ASME PAPER 76-WA/SOL-15]  
The Shenandoah Solar Community Center  
14 p0189 A77-26520  
16 p0476 A77-48974
- WILLIAMS, L. J.**  
Air transportation energy efficiency - Alternatives and implications  
[SAWE PAPER 1124]  
13 p0016 A77-12192
- WILLIAMS, R.**  
Photoelectronic properties of CdTe-electrolyte heterojunctions - Feasibility as solar energy converters  
15 p0320 A77-38330
- WILLIAMS, R. E.**  
The potential for fuel conservation  
14 p0178 A77-24960
- WILLIAMS, R. S., JR.**  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121
- WILLIAMSON, D. G.**  
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production  
16 p0457 A77-48812
- WILLIAMSON, P. R.**  
The Tethered Balloon Current Generator - A space shuttle-tethered subsatellite for plasma studies and power generation  
14 p0184 A77-26200
- WILLIS, J. W.**  
Neutral beam energy and power requirements for the next generation of tokamaks  
[ERDA-76-77]  
14 p0213 A77-17883
- WILLIS, P. B.**  
Investigation of test methods, material properties and processes for solar cell encapsulants  
[NASA-CR-155158]  
16 p0550 A77-33347
- WILSDORF, J.**  
On the production of town gas from off-gases of the chemical processing industry  
14 p0164 A77-23099
- WILSON, A. D.**  
Interpretation of Pennsylvania agricultural land use from ERTS-1 data  
[E77-10111]  
14 p0215 A77-18525
- WILSON, C. J.**  
Energy from solid waste utilization; Proceedings of the Sixth Annual Northeastern Regional Antipollution Conference on a New Source of Materials, Energy and Jobs - Solid Wastes Processing, University of Rhode Island, Kingston, R.I., July 8, 9, 1975  
16 p0433 A77-47210
- WILSON, D. D.**  
Impact of advanced fuel fusion on electric power transmission  
16 p0436 A77-47361
- WILSON, D. E.**  
The multistage heat pipe radiator - An advancement in passive cooling technology  
[AIAA PAPER 77-760]  
Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on)  
[NASA-CR-150152]  
An investigation of peristaltic pumping phenomena with wind energy applications  
15 p0312 A77-37271  
13 p0127 A77-15347  
16 p0545 A77-32586
- WILSON, J. K.**  
Development of nickel-zinc batteries for aircraft  
14 p0195 A77-28148
- WILSON, J. S.**  
Preliminary analysis of electric generation utilizing geopressured geothermal fluids  
13 p0030 A77-12752  
Fluidized-bed combustion of anthracite refuse  
16 p0454 A77-48793  
Environmental assessment of geopressured waters and their projected uses  
[PB-268289/6]  
16 p0544 A77-32579
- WILSON, J. V.**  
Summary report: An exploratory study of cost targets for solar electric power plants  
[ORNL-TN-5787]  
16 p0538 A77-31654
- WILSON, M. M.**  
Superconducting magnet development for the MHD program  
15 p0331 A77-39569
- WILSON, R.**  
Sulphur pollution and emission charges  
13 p0005 A77-11033
- WILSON, R. E.**  
Aerodynamics of the Darrieus rotor  
13 p0050 A77-14559
- WILSON, R. W.**  
Design consideration for the Darrieus rotor  
13 p0044 A77-12872
- WILSON, S. W.**  
Economic optimization of binary fluid cycle power plants for geothermal systems  
13 p0029 A77-12744  
Optimization technique for geothermal power plants using a binary fluid cycle  
[BNWL-2155]  
15 p0394 A77-27546
- WILSON, W. I.**  
Synthetic additives for SO<sub>2</sub> removal from combustion gas in a fluidized-bed coal combustor  
15 p0293 A77-35168
- WINDERLIN, L. S.**  
Evaluation of energy policy  
16 p0415 A77-42859
- WINDINGLAND, L. M.**  
Energy utilization index method for predicting building energy use. Volume 2: Proposed supplement to TB ENG 529  
[AD-A040344]  
Market evaluation study: Solar heating and domestic hot water heating in DoD buildings  
[AD-A042178]  
16 p0521 A77-29608  
16 p0546 A77-32597
- WINDINGLAND, L. W.**  
Market evaluation study: Solar domestic water heaters for DoD barracks  
[AD-A036479]  
16 p0516 A77-28611
- WINDOW, B.**  
Applications of thin graded-index films to solar absorbers  
15 p0260 A77-31244
- WINDSON, J. S.**  
Pumped storage optimization in generation systems  
16 p0506 A77-51284
- WINGGARNER, R. M.**  
Selective absorbers for flat plate collectors  
Heat mirror - A practical alternative to the selective absorber  
16 p0425 A77-44499  
16 p0488 A77-49075
- WINDER, B.**  
Energy transmission from ocean thermal energy conversion plants  
13 p0032 A77-12773
- WINE, C. B.**  
Cost effective solar heating of houses with seasonal storage of energy  
Report on the design, construction, and marketing of two solar heated SPEC houses  
16 p0481 A77-49016  
16 p0496 A77-49141
- WINE, O. H.**  
Intensity effects in SnO<sub>2</sub>-Si heterojunction solar cells  
15 p0259 A77-30736
- WINSLOW, A. M.**  
Numerical model of coal gasification in a packed bed  
16 p0440 A77-48175

- WINSTON, R.  
Ideal concentrators for finite sources and restricted exit angles 13 p0003 A77-10835  
Development of compound parabolic concentrators for solar-thermal electric and process heat applications 13 p0038 A77-12812  
Performance of two fixed-mirror solar concentrators for process heat 13 p0074 A77-19065  
Development of compound parabolic concentrators for solar thermal applications [ASME PAPER 76-WA/SOL-11] 14 p0189 A77-26516  
Optical and thermal design considerations for ideal light collectors 16 p0474 A77-48956  
Development of lightweight compound parabolic concentrators for solar thermal electric and process heat applications 16 p0483 A77-49031  
On the use of solid-dielectric compound parabolic concentrators with photovoltaic devices 16 p0488 A77-49073  
Solar energy concentration [COO-2446-7] 14 p0220 A77-19584
- WINTER, M. G.  
Technology requirements for advanced earth-orbital transportation systems: Summary report [NASA-CR-2867] 16 p0550 A77-33255
- WINTER, S. D.  
Electricity from the thermal power of the sea 14 p0176 A77-24218
- WINTERS, P. A.  
Power deposition in He from the volumetric He-3/n,p/H-3 reaction 16 p0426 A77-45307
- WINTRELL, R.  
The commercial production of hydrogen by the K-T process 13 p0032 A77-12769  
The K-T process - Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 15 p0275 A77-33338  
The K-T process: Koppers commercially proven coal and multi-fuel gasifier for synthetic gas production in the chemical and fertilizer industries 14 p0237 A77-21567
- WIRTZ, R.  
The DUB bus, a suburban bus with electric drive, supplied either from overhead wire or from battery 14 p0161 A77-22913
- WISE, C. E.  
'Free' and renewable energy sources 15 p0289 A77-34306  
Wind energy - Bounty in the breeze 16 p0418 A77-43123
- WISE, D. L.  
Fuel gas recovery from controlled landfilling of municipal wastes 13 p0070 A77-18739  
Packed bed digestion of solid wastes 15 p0323 A77-39107  
Methane production from solid waste 16 p0434 A77-47218
- WISE, J. J.  
Design of a 100 BPD pilot plant to convert methanol to gasoline using the Mobil process 13 p0023 A77-12691  
Mobil process for the conversion of methanol to gasoline 14 p0193 A77-27299
- WISINSKI, L. J.  
Synthesis and analysis of jet fuel from shale oil and coal syncrudes [NASA-CR-135112] 13 p0103 A77-12230
- WISLER, B. B., JR.  
Hydrodynamic equilibrium conditions for AG(EH) main strut-pod foil system using flap incidence control [AD-A027521] 13 p0127 A77-15220
- WISWALL, R. E.  
Hydrogen absorption in Ti3Al 16 p0506 A77-51372
- WITCOWSKI, R. D.  
The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0171 A77-23718  
Hydrogen-fueled subsonic aircraft: A perspective 13 p0084 A77-10344  
The thermal efficiency and cost of producing hydrogen and other synthetic aircraft fuels from coal 14 p0243 A77-21627  
Alternate aircraft fuels: Prospects and operational implications [NASA-TM-X-74030] 16 p0511 A77-28322
- WITHERSPOON, J. W.  
Air transport propulsion for the 1980's 14 p0138 A77-20717  
Air transport propulsion for the 1980's 13 p0117 A77-13980
- WITTEMAN, W. G.  
Thermochemical cycles utilizing sulfur for hydrogen production from water 15 p0276 A77-33353
- WITTIG, S. L. K.  
In situ optical measurement of automobile exhaust gas particulate size distributions - Regular fuel and methanol mixtures 16 p0440 A77-48173
- WITWER, J. G.  
The prospects for renewable energy sources 16 p0415 A77-42858  
Agricultural and forestry wastes as an energy resource 16 p0489 A77-49083  
Costs of alternative sources of electricity [PB-255765/0] 13 p0107 A77-12528
- WOCASEK, F. B.  
The solid-fuel gas turbine for industrial energy production 16 p0453 A77-48785
- WODZKI, R.  
Simplex optimization of carbon electrodes for the hydrogen oxygen membrane fuel cell 16 p0500 A77-50200
- WOJTCWICZ, A.  
Design of minimum-weight diffusion batteries [PB-266217/9] 16 p0518 A77-28645
- WOLBERS, R. L.  
A space station for the 1980's - A look at the next generation of operational systems and their functional requirements [ASME PAPER 77-ENAS-37] 16 p0432 A77-46878
- WOLF, D. A.  
Heat pipes in flat plate solar collectors [ASME PAPER 76-WA/SOL-12] 14 p0189 A77-26517
- WOLF, M.  
Silicon solar cell development 14 p0148 A77-21784  
The University of Pennsylvania Solar Heating/Cooling System Program 14 p0167 A77-23439
- WOLFE, B. L., JR.  
Development of a small, low cost turbojet engine with thrust augmentation 16 p0434 A77-47347
- WOLFE, L. E.  
Laboratory investigation of high temperature alloy failure mechanisms 15 p0271 A77-32608
- WOLFE, M. G.  
Photovoltaic, gravitationally-stabilized solid-state, satellite solar power station [AIAA PAPER 77-511] 14 p0173 A77-23927  
The evolution of the photovoltaic, gravitationally stabilized, solid-state satellite solar power station 16 p0464 A77-48874
- WOLPER, B. B.  
Design techniques for modular integrated utility systems [NASA-TM-X-58189] 14 p0253 A77-22005  
Preliminary design study of a baseline MHD [NASA-TM-X-58193] 16 p0561 A77-34050
- WOLGAST, R.  
Performance of an air-cooled ammonia-water absorption air conditioner at low generator temperatures 16 p0475 A77-48962

- WOLLENBERG, H. A.  
Geothermal studies in northern Nevada 13 p0029 A77-12742  
Geothermal studies in northern Nevada [LBL-4451] 14 p0221 N77-19589
- WOLNBER, H. A.  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project [NASA-CR-149242] 13 p0105 N77-12513
- WONG, D.  
Study of corrosion and its control in aluminum solar collectors [COO-2934-76-1] 15 p0383 N77-26673
- WONG, M. J.  
Factors influencing the economics of large-scale in situ coal gasification operations 15 p0306 A77-36765
- WOO, E. Y. K.  
Regenerative vapor cycle with isobutane as working fluid [PB-262704/0] 15 p0356 N77-23622
- WOOD, B. D.  
Solar heating and cooling and energy conservation potentials for commercial buildings [ASME PAPER 76-WA/SCL-17] 14 p0189 A77-26522  
Considerations for using solar concentrators in photovoltaic systems 16 p0460 A77-48835  
Steady-state and transient performance limitations of the ARKLA Solair absorption cooling system 16 p0478 A77-48987  
Solar retrofit applications for public buildings 16 p0479 A77-48997
- WOOD, J. M.  
Improved, inexpensive solar collectors for agricultural requirements 16 p0488 A77-49077
- WOOD, L. A.  
Energy management guide for light industry and commerce. EPIC energy management series [PB-263121/6] 15 p0356 N77-23616
- WOOD, P.  
The interaction of batteries and fuel cells with electrical distribution systems - Line commutated converter interface 16 p0414 A77-42634  
The interaction of batteries and fuel cells with electrical distribution systems - Force commutated converter interface 16 p0414 A77-42635
- WOOD, W.  
Economic assessment of the utilization of fuel cells in electric utility systems [AIAA 77-1012] 16 p0403 A77-41559  
Economic assessment of the utilization of fuel cells in electric utility [EPRI-EM-336] 15 p0392 N77-27516
- WOODALL, J. E.  
An isothermal etchback-regrowth method for high-efficiency Ga<sub>1-x</sub>Al<sub>x</sub>/As-GaAs solar cells 15 p0257 A77-30372
- WOODCOCK, C. B.  
Satellite power systems for large-scale power generation [IAF PAPER 76-118] 13 p0003 A77-10914
- WOODCOCK, G.  
Closed Brayton cycle turbines for satellite solar power stations 15 p0296 A77-35816  
Solar power satellites - A system overview 16 p0463 A77-48868
- WOODCOCK, G. B.  
Transportation options for solar power satellites 13 p0040 A77-12829  
Solar power satellites - Opportunity and challenge [AIAA PAPER 77-291] 13 p0065 A77-18224  
Large-scale space operations for Solar Power Satellites [AIAA PAPER 77-1031] 16 p0413 A77-42483  
Solar satellites - Space key to our power future 16 p0413 A77-42560
- WOODFORD, D. A.  
Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results [NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635
- WOODLAND, L.  
Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Boss Corporation [PB-268232/6] 16 p0542 N77-32051
- WOODMAN, T. F.  
The effect of design and operating parameters on the performance of flat plate solar collectors - Calculation method and detailed appraisal 16 p0406 A77-41580
- WOODRUFF, E. M.  
Geothermal water and gas: Collected methods for sampling and analysis: Comment issue [BNWL-2094] 14 p0249 N77-21679
- WOODSON, H. B.  
The design, fabrication and testing of a five megajoule monopolar motor-generation 15 p0299 A77-36311
- WOOLLEY, R. L.  
Performance of a hydrogen-powered transit vehicle 13 p0033 A77-12781  
Water induction in hydrogen-powered IC engines 14 p0171 A77-23721  
Dynamic tests of hydrogen-powered IC engines 15 p0282 A77-33395  
Modification techniques and performance characteristics of hydrogen-powered IC engines - State of the art, 1975 15 p0282 A77-33396  
Water induction in hydrogen-powered IC engines 14 p0243 N77-21631  
Dynamic tests of hydrogen-powered IC engines 14 p0244 N77-21633  
Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975 14 p0244 N77-21634
- WOOLSEY, M. F.  
Catalytic hydrogenation of solvent-refined lignite to liquid fuels 13 p0008 A77-11443
- WORSOR-SCHMIDT, P.  
Solar-powered refrigeration by intermittent solid absorption systems 13 p0078 A77-19106
- WRENCH, M. S.  
User experience with the Enfield car 14 p0159 A77-22884
- WRIGHT, A.  
The ONERSOL collector and its performance 14 p0150 A77-21809  
The thermodynamic cycle of the ONERSOL engine 14 p0152 A77-21829
- WRIGHT, B. B.  
Engine performance and fire-safety characteristics of water-containing diesel fuels [AD-A036011] 15 p0377 N77-26330
- WRIGHT, H. E.  
Development of a small, low cost turbojet engine with thrust augmentation 16 p0434 A77-47347
- WRIGHT, J. K.  
Large-scale electrical power generation and storage 13 p0006 A77-11039
- WRIGHT, J. P.  
The multistage heat pipe radiator - An advancement in passive cooling technology [AIAA PAPER 77-760] 15 p0312 A77-37271  
Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on) [NASA-CR-150152] 13 p0127 N77-15347
- WRIGHT, M. E.  
Thermal energy storage 16 p0461 A77-48841
- WRIGHT, R. J.  
Design of closed-cycle MHD generator with nonequilibrium ionization and system 15 p0303 A77-36381
- WRIGHTON, M. S.  
Photoassisted electrolysis of water - Conversion of optical to chemical energy 13 p0021 A77-12666  
The chemical conversion of sunlight 15 p0287 A77-33598
- WRIGLEY, C.  
Advanced vertical-junction silicon solar cells [AIAA PAPER 77-486] 14 p0172 A77-23906



- WRONSKI, C. R.  
Electronic properties of amorphous silicon in solar cell operation  
15 p0257 A77-30717
- WU, C. C.  
Design and modeling of solar sea power plants by geometric programming  
[COO-2895-T1]  
14 p0231 N77-20585
- WU, E.  
Fiber composite program for flywheel applications  
[UCRL-5C033-76-1]  
15 p0345 N77-22633
- WU, E. H.  
Optimal design of anisotropic (fiber-reinforced) flywheels  
[UCRL-52169]  
16 p0522 N77-29616
- WU, Y. C.  
Comparative performance of solar thermal power generation concepts  
13 p0036 A77-12803
- WU, Y. C. L.  
Performance theory of diagonal conducting wall MHD generators  
13 p0001 A77-10202
- Investigation of direct coal-fired MHD power generation  
13 p0034 A77-12783
- Experimental investigation on a direct coal-fired MHD generator  
14 p0141 A77-21238
- Experimental investigation of multiple-loaded diagonal conducting wall generators  
15 p0325 A77-39529
- Three dimensional current distribution in diagonal conducting wall channels  
15 p0329 A77-39556
- A description of the direct coal-fired MHD facility at the University of Tennessee Space Institute  
16 p0458 A77-48823
- WU, Y.-C.  
The dilemma of future electric power demand  
14 p0167 A77-23391
- Coal - The fossil energy source for the transition period  
14 p0167 A77-23392
- WUESTER, G.  
Hydrogen production using nuclear heat  
13 p0057 A77-16211
- WURN, J.  
Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock  
14 p0200 A77-29437
- WYBERG, G. B.  
Transport theory of 3M high-performance thermoelectric materials  
13 p0042 A77-12848
- WYETH, H. C.  
Sheet resistance component of series resistance in a solar cell as a function of grid geometry  
16 p0402 A77-41437
- Y**
- YADAVALLI, S. R.  
A new generation scheme for large wind energy conversion systems  
13 p0043 A77-12868
- YAGODKIN, I. V.  
Some features of start-up of alkali metal heat pipes  
13 p0119 N77-14383
- YAJNIK, K. S.  
Energy-turn-rate characteristics and turn performance of an aircraft  
15 p0265 A77-31855
- YAMAGIWA, A.  
Experimental evaluation of a solar/wind-powered space heating and hot water heating system in the Pacific Northwest  
16 p0462 A77-48849
- YAMAGUCHI, K.  
Ceramic thin film CdTe solar cell  
14 p0135 A77-19635
- YAMAGUCHI, H.  
Water-splitting-system synthesized by photochemical and thermoelectric utilizations of solar energy  
15 p0274 A77-33334

- YAMAHOTO, J. H.  
Potential alternative fuel derivatives from municipal solid wastes  
16 p0433 A77-47213
- YANASAKI, H.  
MHD power generation with fully ionized seed  
16 p0443 A77-48571
- YANAORA, H.  
A new design for the high-performance sodium-sulfur battery  
[SAB PAPER 770281]  
16 p0424 A77-44564
- YANAGI, K.  
A study on solar tower power system  
14 p0152 A77-21832
- YANG, C.  
Biomass energy for Hawaii. Volume 1 - Summary and background. Volume 2 - Sugar operations. Volume 3 - Mixed municipal refuse. Volume 4 - Terrestrial and marine plantations  
16 p0428 A77-46250
- YANG, V.  
Cassava fuel alcohol in Brazil  
16 p0444 A77-48707
- YANOW, G.  
Options for demonstrating the use of solar energy in California buildings  
[NASA-CR-154103]  
16 p0513 N77-28582
- YAO, H. P.  
Applications and prospect of energy storage batteries  
[CONF-760416-2]  
14 p0230 N77-20578
- Batteries for utility load leveling  
[CONF-760469-3]  
14 p0231 N77-20579
- YARLAGADDA, R. K.  
Development and adaptation of field modulated generator systems for wind energy applications  
[PB-263604/1]  
15 p0357 N77-23625
- YARON, I.  
Performance of absorption cycle operating with low thermal-potential energy sources for direct-contact cooling applications  
16 p0450 A77-48756
- YARZAB, R. P.  
Problems and solutions in the use of coal analyses  
[FE-0390-1]  
13 p0097 N77-11535
- YASUI, R. K.  
Performance data for a terrestrial solar photovoltaic/water electrolysis experiment  
15 p0256 A77-30321
- YATCKO, P.  
Economic assessment of the utilization of fuel cells in electric utility systems  
[AIAA 77-1012]  
16 p0403 A77-41559
- Economic assessment of the utilization of fuel cells in electric utility  
[EPRI-EM-336]  
15 p0392 N77-27516
- YAVORSKY, P. H.  
Dilute-phase hydrogasification process for SNG production  
14 p0191 A77-27277
- Economic feasibility of the conversion of organic waste to fuel oil and pipeline gas  
15 p0302 A77-36346
- YCAS, J. W.  
The paliothrophic origin of energy metabolism  
13 p0064 A77-17895
- YAGER, K.  
Impact of air quality regulation on the electric power industry  
16 p0452 A77-48775
- YARGAN, J. R.  
Optimization of silicon solar cell design for use under concentrated sunlight  
15 p0257 A77-30714
- YEE, S. T.  
Vibration characteristics of a large wind turbine tower on non-rigid foundations  
[NASA-TN-X-73670]  
15 p0378 N77-26613
- YEH, H.  
Thermal energy storage considerations for solar-thermal power generation  
13 p0027 A77-12732
- YEH, J. W.  
Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 1: Digest of detailed data base descriptions  
[UCID-17316-PT-1]  
15 p0387 N77-27036

- Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 2: Detailed data base descriptions  
[UCID-17316-PT-2] 15 p0387 N77-27037
- YEH, W.  
Analysis of information systems for hydropower operations: Executive summary  
[NASA-CR-149342] 13 p0122 N77-14586
- YEH, W. W. G.  
Analysis of information systems for hydropower operations  
[NASA-CR-149373] 13 p0129 N77-15497
- YEH, Y. C. H.  
Technology of GaAs metal-oxide-semiconductor solar cells 15 p0259 A77-30739
- High-efficiency thin-film GaAs solar cells  
[PB-258453/6] 14 p0212 N77-17599
- YKUTIELI, G.  
Solar cell array for concentrated sunlight 16 p0460 A77-48836
- YEH, J. T.  
Tornado-type wind energy system - Basic consideration  
[ASME PAPER 76-WA/ENER-2] 14 p0185 A77-26431
- YEH, T. P.  
Evaluation of coal liquefaction efficiency based on various ranks 13 p0009 A77-11244
- Shale oil, tar sands, and related fuel sources 14 p0169 A77-23551
- Solution of silica in Green River oil shale 14 p0169 A77-23558
- Feasibility studies of a biochemical desulfurization method 14 p0170 A77-23562
- Science and technology of oil shale 16 p0442 A77-48502
- YEH, Y. K.  
Batch autoclave studies of catalytic hydrodesulfurization of coal 14 p0145 A77-21617
- YEO, R. S.  
A hydrogen-halogen energy storage system for electric utility applications 16 p0457 A77-48818
- Hydrogen-halogen energy storage system: Preliminary feasibility and economic assessment  
[BNL-22164] 16 p0537 N77-31635
- YOUNG, K. C.  
Numerical solutions for steady free convection in island geothermal reservoirs 14 p0174 A77-24205
- YEW, H.-C.  
Small electric vehicle considerations in view of performance and energy usage 13 p0024 A77-12698
- YIEN, D.  
Resource utilization efficiency improvement of geothermal binary cycles, phase 1  
[ORO-4944-3] 13 p0123 N77-14600
- YIPFAR, S.  
The contribution of nuclear technology toward the solution of energy problems  
[INIS-EP-1867] 13 p0100 N77-11565
- YIH, G. K.  
The power conversion efficiency of the gold-Rhodamine B-gold photoelectrochemical cell 16 p0406 A77-41583
- YIH, H. C.  
Report on United States international cooperation in solar energy technology development 16 p0495 A77-49132
- YINGLING, R. D.  
High-efficiency GaInAs/GaAs heterostructure solar cells grown by metalorganic chemical vapor deposition 16 p0408 A77-41741
- YOCKE, M. L.  
Theoretical, numerical, and physical techniques for characterizing power plant plumes  
[PB-253099/6] 13 p0101 N77-11599
- The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California: Data analysis and emission impact model  
[PB-264822/8] 16 p0517 N77-28628
- YONAS, G.  
Electron beam research at Sandia Laboratories, USA 14 p0138 A77-20706
- YOO, H. I.  
Silicon solar cells on unidirectionally recrystallized metallurgical silicon 15 p0258 A77-30731
- YOSHIDA, K.  
Effective conversion processes between thermal and chemical energies - Thermodynamic study of multistep water decomposition processes 15 p0275 A77-33344
- Effective conversion processes between thermal and chemical energies: Thermodynamic study of multistep water decomposition processes 14 p0238 N77-21576
- YOSHIHARA, A.  
A study on solar tower power system 14 p0152 A77-21832
- YOSHIKAWA, A.  
High efficiency n-CdS/p-InP solar cells prepared by the close-spaced technique 14 p0156 A77-22081
- YOSHINIZU, Y.  
Operation results of the desulfurization plant for a thermal power station 15 p0299 A77-36279
- YOSHINURA, H.  
Test results on the spinel electrode module in laboratory and simulated MHD environment 14 p0140 A77-21227
- Design and performance of high temperature ceramic electrode modules 15 p0327 A77-39543
- YOST, S. W.  
The future of natural gas: Economic myths, regulatory realities  
[PB-263625/6] 15 p0356 N77-23621
- YOUNG, J. E.  
Environmental cost/benefit analysis for fusion power plants  
[BNWL-2028] 16 p0549 N77-32893
- YOUNG, L. E.  
SEP solar array technology development 13 p0040 A77-12825
- SEP full-scale wing technology development 16 p0463 A77-48860
- YOUNG, L. Y.  
Heat treatment of refuse for increasing anaerobic biodegradability  
[PB-252924/6] 13 p0101 N77-11577
- YOUNG, R.  
Wind-powered hydrogen electric systems for farm and rural use  
[PB-259318/4] 14 p0226 N77-19667
- YOUNG, R. B.  
Production of methane using offshore wind energy 13 p0026 A77-12722
- YOUNG, R. K.  
Current status of the BI-GAS process 14 p0193 A77-27300
- YOUNG, W. E.  
Joint test of an U.S. electrode system in the U.S.S.R. U-02 facility 14 p0139 A77-21215
- ECAS MHD system studies 14 p0142 A77-21268
- YOUNGER, F. C.  
Whirl stability of the pendulously supported flywheel system  
[ASME PAPER 77-APR-20] 15 p0323 A77-38837
- YOUNGQUIST, W.  
Pacific Northwest geothermal: 1976 review, 1977 outlook 15 p0335 A77-39817
- YU, O. S.  
Nuclear power, coal and energy conservation /with a note on the costs of a nuclear moratorium/ 13 p0013 A77-11524
- YU, W. S.  
Hydrogen storage via iron-titanium for a 26 MW/e/ peaking electric plant 13 p0048 A77-13543
- Closed Brayton cycle using hydrogen as a work fluid  
[BNWL-20899] 13 p0085 N77-10542
- The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling 14 p0242 N77-21621

## YU, W.-S.

- The behavior of iron titanium hydride test beds -  
Long-term effects, heat transfer and modeling  
15 p0280 A77-33386

## YUAN, S. W.

- A central solar energy utilization system  
13 p0057 A77-16210  
Application of heat pipes to ground storage of  
solar energy  
[AIAA PAPER 77-729] 15 p0324 A77-39507

## YUDOW, B.

- Energy transmission from ocean thermal energy  
conversion plants  
13 p0032 A77-12773  
Ocean thermal energy delivery systems based on  
chemical energy carriers  
15 p0279 A77-33375  
Wind-powered hydrogen electric systems for farm  
and rural use  
[PB-259318/4] 14 p0226 A77-19667  
Ocean thermal energy delivery systems based on  
chemical energy carriers  
14 p0240 A77-21609

## YUEN, C.

- Thermoelectronic laser energy conversion for power  
transmission in space  
16 p0464 A77-48876

## YUEN, P. C.

- Geothermal energy in Hawaii - Hydrothermal systems  
13 p0029 A77-12741  
The Hawaii geothermal project, initial phase 2  
progress report  
[PB-263120/8] 15 p0355 A77-23594

## YUNG, D.

- Water requirements for steam-electric power  
generation and synthetic fuel plants in the  
western United States  
[PB-268067/7] 16 p0540 A77-31667

## YUSKUS, W. J.

- Transportation programming, economic analysis, and  
evaluation of energy constraints  
[PB-262878/2] 15 p0370 A77-25018

## Z

## ZABOLOTNY, E. B.

- Evaluation of the practical aspects of the use of  
coal derived synthetic fuels  
[ASME PAPER 76-WA/APC-6] 14 p0184 A77-26411  
Northeastern utilities are meeting the clean air  
challenge  
16 p0424 A77-44612

## ZACHARIAS, P.

- Further Stirling engine development work. I  
16 p0442 A77-48496

## ZACHHANN, H. C.

- Solar energy depot  
[AIAA PAPER 77-726] 15 p0311 A77-37251

## ZAHARIA, R.

- Design of pointed solar concentrators  
16 p0417 A77-42954

## ZAHAVI, J.

- An application of the economic-environmental power  
dispatch  
15 p0317 A77-38121

## ZAITSEV, V. M.

- Some questions concerning the creation of a solar  
thermionic converter system  
15 p0315 A77-37765  
Some problems involved in the development of a  
solar thermionic power plant  
16 p0436 A77-47421

## ZAITSEVA, A. K.

- Influence of doped-layer parameters on  
photoelectric characteristics of silicon  
photovoltaic cells  
13 p0014 A77-11916  
Use of radiation reflected from earth to increase  
the power of solar panels  
15 p0363 A77-24586

## ZAJIC, J. E.

- Microbial hydrogen production  
15 p0278 A77-33367  
Microbial hydrogen production  
14 p0239 A77-21601

## ZAKHARKO, I. A.

- Study of the icnization of the additive in MHD  
installations  
13 p0002 A77-10424

- Measurement of the excess oxidant ratio in the  
combustion products of an MHD-generator  
14 p0136 A77-20107

## ZAKHIDOV, R. A.

- Radiant-vector distribution in the radiant field  
of a parabolocylindric concentrator  
13 p0015 A77-11920  
Energetic calculation of the concentrating  
capacity of paraboloidal facets  
13 p0051 A77-14579  
Standard-size facets for the reflecting surface of  
a solar concentrator  
13 p0063 A77-17557  
The quality category in solar engineering  
14 p0143 A77-21310  
Concentrating power of spherical facets  
14 p0179 A77-25357  
The use of lasers for the inspection of  
heliotechnical reflectors  
15 p0286 A77-33432  
Paraboloid-hyperboloid concentrating systems and  
their accuracy  
15 p0286 A77-33433  
Energy computation of concentrating capability of  
paraboloidal facets  
15 p0290 A77-34973  
Analysis of a faceted concentration system  
15 p0316 A77-37769  
Concentrating capability of spherical facets  
16 p0409 A77-41907  
Using lasers to inspect solar-energy reflectors  
16 p0427 A77-45545  
Paraboloid-hyperboloid concentrating systems and  
their accuracy  
16 p0427 A77-45546  
Analyzing multifacet concentrating systems  
16 p0437 A77-47425  
Contribution to procedures for testing Silazan  
resin coatings  
16 p0443 A77-48522  
Radiative heat transfer in cavity type  
axisymmetric collectors for high-temperature  
solar energy plants  
16 p0443 A77-48523

## ZALKIND, V.

- The second joint test of a U.S. electrode system  
in the U.S.S.R. U-02 facility  
15 p0327 A77-39540

## ZALKIND, V. I.

- Study of cathode spots in the presence of slag  
films on the electrodes of an open-cycle MHD  
generator  
13 p0053 A77-15005  
Study of the electrical characteristics of the  
boundary layer on the metal surfaces in the  
channels of an open cycle MHD generator  
13 p0054 A77-15666  
Cathode spots on metallic electrodes of an  
MHD-channel  
15 p0269 A77-32518  
Study of the maximum Hall voltages and  
interelectrode breakdown in the channel of an  
open-cycle MHD generator - A joint U.S.-U.S.S.R.  
experiment on the U02 facility MHD generator  
15 p0329 A77-39554

## ZANDER, E.

- Basic requirements for the various items of  
equipment for supplying energy to electrically  
driven road vehicles from the point of view of  
the user  
14 p0160 A77-22890

## ZAODE, V. V.

- Use of radiation reflected from earth to increase  
the power of solar panels  
15 p0363 A77-24586

## ZARB, P. G.

- Perspective on energy policy  
[PB-261736/3] 15 p0348 A77-22674

## ZARIPOV, V. K.

- Investigation of the thermophysical  
characteristics of low-temperature heat pipes  
with metal-fiber wicks  
13 p0050 A77-14321  
Structural heat conductivity of fiber metal wicks  
for heat pipes  
13 p0050 A77-14326

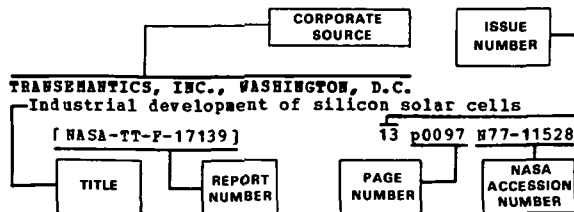
- Investigation of the effective heat conductivity of metal-fiber wicks for low-temperature heat pipes  
16 p0500 A77-49988
- ZATELEPIN, V. B.  
A consideration of some three-dimensional effects in MHD channel  
15 p0330 A77-39560
- ZAUDERER, B.  
System studies of coal fired-closed cycle MHD for central station power plants  
13 p0034 A77-12786  
Engineering aspects of magnetohydrodynamics; Proceedings of the Fifteenth Symposium, University of Pennsylvania, Philadelphia, Pa., May 24-26, 1976  
14 p0139 A77-21214  
System studies of coal fired-closed cycle MHD for central station power plants  
14 p0142 A77-21267  
Coal fired non-equilibrium closed cycle MHD power plant system since ECAS  
15 p0332 A77-39576  
MHD generator investigations [AD-A032790]  
15 p0358 A77-23952
- ZAVGORODNIIAIA, O. V.  
Thermal properties of subsurface rocks in the Ukraine  
16 p0443 A77-48647
- ZAWORSKI, B. J.  
Solar pond stability experiments  
16 p0482 A77-49028
- ZEILIGER, A. B.  
Closed costs of electrical energy for different zones of load graphs of electrical energy systems  
16 p0437 A77-47751
- ZEITLER, G.  
On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells  
16 p0425 A77-45151
- ZEITNER, B. J.  
Development of compact lithium/iron disulfide electrochemical cells  
13 p0026 A77-12715
- ZELIGER, B. I.  
Flue gas desulfurization by fly ash  
16 p0504 A77-51146
- ZELINKA, R.  
The M.A.N. electrobus experience gained in large-scale tests  
14 p0160 A77-22900
- ZENKOSKI, J.  
The potential for application of energy storage capacity on electric utility systems in the United States. I  
13 p0054 A77-15625
- ZENER, C.  
The OPEC answer to OPEC - Solar sea power  
15 p0303 A77-36409  
A comparison of the economics of nuclear and solar power  
16 p0485 A77-49049
- ZENTNER, R. C.  
Performance of low cost solar reflectors for transferring sunlight to a distant collector  
14 p0180 A77-25896  
Thermal scale modeling of the central receiver of a helium Brayton cycle solar powerplant  
16 p0445 A77-48717
- ZEVAIL, A. B.  
Photon trapping and energy transfer in multiple-dye plastic matrices - An efficient solar-energy concentrator  
16 p0418 A77-43070
- ZHELIN, V. A.  
Investigation of two-dimensional electric effects in a sectional MHD-channel  
15 p0317 A77-37930
- ZHIDKOVA, E. V.  
Influence of doped-layer parameters on photoelectric characteristics of silicon photovoltaic cells  
13 p0014 A77-11916
- ZHILINSKII, A. P.  
Investigation of the Hall effect in the plasma of an inductive high-frequency discharge  
15 p0297 A77-36088
- ZHIRKOV, P. V.  
Thermal explosion of moving reacting fluids of variable viscosity  
13 p0052 A77-14980
- ZHORZHOIANI, G. I.  
The analysis of the temperature regimes of the operation of a gas-regulated heat pipe  
13 p0064 A77-17924
- ZHUROV, I. A.  
The relation between isotopic composition of argon and carbon in natural gases [NASA-TM-75134]  
16 p0531 A77-30680
- ZIEGENBEIN, B.  
The BBC solar house - Design and experience  
15 p0336 A77-39984
- ZIEMER, H.  
Manufacturing and evaluation of phthalocyanines as catalysts for fuel cells [BMFT-PB-T-76-25]  
13 p0114 A77-13540
- ZIMMERHACKL, B.  
On the application of radioisotope techniques for the study of phthalocyanine catalyzed electrochemical processes in fuel cells  
16 p0425 A77-45151  
Investigation of acid-resistant electrocatalysts for fuel cells [NASA-TT-F-17367]  
14 p0207 A77-16444
- ZIMMERMAN, J. S.  
Wind energy: A renewable energy option  
16 p0525 A77-30276
- ZIMMERMAN, M. B.  
The supply of coal in the long run: The case of eastern deep coal [PB-252642/4]  
13 p0086 A77-10626
- ZIMMERMAN, M. D.  
Sea water - The energy elixir  
15 p0320 A77-38446
- ZIMMERMAN, W. F.  
Alkali metal space power technology applicable to national energy research and development [AIAA PAPER 77-289]  
13 p0065 A77-18223
- ZINK, R. A.  
Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary [PB-255994/6]  
13 p0107 A77-12533  
Impacts of synthetic liquid fuel development. Automotive market. Volume 2 [PB-255995/3]  
13 p0108 A77-12534
- ZOLLER, W. B.  
Composition and size distribution of in-stack particulate material at a coal-fired power plant  
14 p0139 A77-21018
- ZOOK, J. D.  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project [NASA-CR-149242]  
13 p0105 A77-12513
- ZORAN, B.  
Comparative discussion on measurements of atmospheric natural radioactivity and pollution by coal smoke particles  
15 p0294 A77-35349
- ZOUTENDYK, J. A.  
Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion  
16 p0485 A77-49052
- ZRELOV, V. B.  
Thermal stability improvement of diesel fuels of isopropyloctadecylamine [NASA-TT-F-17300]  
15 p0388 A77-27242
- ZUCKER, O. S. F.  
Energy storage, compression, and switching  
15 p0299 A77-36284
- ZVIRIN, Y.  
Heat transfer analysis of a flat-plate solar energy collector  
16 p0501 A77-50207
- ZWEIG, R. M.  
Operation cough drop  
14 p0247 A77-21665
- ZYGIELBAUM, P. S.  
MHD power generation - 1976 Status Report  
13 p0033 A77-12782  
Open-cycle coal burning MHD power plants for commercial service  
15 p0333 A77-39578

# CORPORATE SOURCE INDEX

ENERGY / A Continuing Bibliography (Issue 16)

JANUARY 1978

## Typical Corporate Source Index Listing



The title of the document is used to provide a brief description of the subject matter. The issue, page number and NASA or AIAA accession number are included in each entry to assist the user in locating the abstract in the abstract section of an individual supplement of *Energy*. If applicable a report number is also included as an aid in identifying the document.

## A

- ABCOR, INC., CAMBRIDGE, MASS.  
Growth effects of major land use projects.  
Volume 2: Compilation of land use based  
emission factors  
[PB-255302/2] 13 p0092 N77-10709
- ACADEMIA R. P. R., BUCHAREST.  
Hydrogen economy analysis using decision theory  
14 p0247 N77-21663
- ACE-FEDERAL REPORTERS, INC., WASHINGTON, D. C.  
Creating energy choices for the future  
[CONF-751228-P1] 13 p0087 N77-10647
- Energy technologies for the west: Possible  
effects of Energy Technology on Land, Water,  
and Air Resources  
[TID-27444] 16 p0556 N77-33632
- ACRES AMERICAN, INC., BUFFALO, N. Y.  
Underground pumped storage research priorities  
[PB-254413/8] 13 p0089 N77-10667
- ACUREX CORP., MOUNTAIN VIEW, CALIF.  
Alternate petroleum based fuels for naval fleet  
usage: potential availability, cost, and  
system impact  
[AD-A041980] 16 p0551 N77-33372
- ADAPT SERVICE CORP., READING, MASS.  
Effect of mechanical cooling devices on ambient  
salt concentration  
[PB-256679/2] 13 p0125 N77-14631
- ADDIS TRANSLATIONS INTERNATIONAL, PORTOLA VALLEY,  
CALIF.  
Underground fuel gasification  
[UCRL-TRANS-10998] 13 p0088 N77-10659
- Hybrid drive with kinetic energy store as  
vehicle drive  
[UCRL-TRANS-11018] 13 p0120 N77-14486
- ADELAIDE UNIV. (AUSTRALIA).  
The photosynthetic production of hydrogen  
14 p0239 N77-21602
- ADVISORY GROUP FOR AEROSPACE RESEARCH AND  
DEVELOPMENT, PARIS (FRANCE).  
Variable Geometry and Multicycle Engines  
[AGARD-CP-205] 15 p0339 N77-22112
- AEG-TELEFUNKEN, FRANKFURT AM MAIN (WEST GERMANY).  
Non-nuclear energy technology. Low temperature  
cable for power transmission  
[BHFT-PE-T-76-01] 14 p0210 N77-17372
- AEG-TELEFUNKEN, HAMBURG (WEST GERMANY).  
Experimental study of the theoretical and  
technological possibilities to manufacture  
solar cells using GaAs-layers on  
GaAs-structures  
[BHFT-PE-W-76-10] 14 p0212 N77-17584

- AEROJET NUCLEAR CO., IDAHO FALLS, IDAHO.  
Geothermal R and D project report  
[ANCR-1283] 13 p0124 N77-14605
- Conceptual study for total utilization of an  
intermediate temperature geothermal resource  
[ANCR-1260] 14 p0211 N77-17579
- AERONAUTICAL RESEARCH LABS., MELBOURNE (AUSTRALIA).  
Hydrocarbon fuels from solar energy via the alga  
Botryococcus brauni  
[ARL/MECH-ENG-148] 16 p0513 N77-28576
- AEROSPACE CORP., EL SEGUNDO, CALIF.  
Photovoltaic, gravitationally-stabilized  
solid-state, satellite solar power station  
/GSS4PS/  
[AIAA PAPER 77-511] 14 p0173 A77-23927
- Personal rapid transit research conducted at the  
Aerospace Corporation  
[PB-256846/7] 13 p0111 N77-12946
- Research plan for achieving reduced automotive  
energy consumption  
[PB-255929/2] 13 p0121 N77-14495
- Penetration analysis and margin requirements  
associated with large-scale utilization of  
solar power plants  
[PB-257546/2] 14 p0208 N77-16459
- AEROSPACE CORP., GERMANTOWN, MD.  
Energy recovery from municipal solid waste, an  
environmental and safety mini-overview survey  
[ATR-76 (7518)-7] 15 p0369 N77-25011
- Geothermal energy, an environmental and safety  
mini-overview survey  
[ATR-77 (7518)-1] 16 p0514 N77-28590
- AEROSPACE CORP., LOS ANGELES, CALIF.  
Control of waste and water pollution from power  
plant flue gas cleaning systems  
[PB-259211/1] 14 p0227 N77-19953
- AEROTHERM ACUREX CORP., MOUNTAIN VIEW, CALIF.  
Evaluation of molten scrubbing for fine  
particulate control  
[PB-266092/6] 16 p0517 N77-28642
- AIA RESEARCH CORP., WASHINGTON, D. C.  
Early use of solar energy in buildings. A study  
of barriers and incentives to the widespread  
use of solar heating and cooling systems  
[PB-267832/4] 16 p0539 N77-31663
- Early use of solar energy in buildings. A study  
of barriers and incentives to the widespread  
use of solar heating and cooling systems  
[PB-267832/4] 16 p0554 N77-33618
- AIR FORCE ACADEMY, COLO.  
Solar heating retrofit of military family housing  
[AD-A030843] 14 p0226 N77-19659
- The spatial characteristics of three Wyoming fuels  
[AD-A030873] 14 p0233 N77-20612
- AIR FORCE AERO PROPULSION LAB., WRIGHT-PATTERSON  
AFB, OHIO.  
The impact of JP-4/JP-8 conversion on aircraft  
engine exhaust emissions  
[AD-A026546] 13 p0112 N77-13234
- Potential improvements in engine performance  
using a variable geometry turbine  
15 p0340 N77-22141
- Demonstration testing of a Vuilleumier  
cryocooler with an integral  
[AD-A042786] 16 p0547 N77-32599
- Investigation of GaAs solar cell potential  
performance and cost  
[AD-A040736] 16 p0553 N77-33612
- AIR FORCE CIVIL ENGINEERING CENTER, TYNDALL AFB, FLA.  
Waste POL disposal through energy recovery  
[AD-A031783] 14 p0235 N77-20957

- AIR FORCE FLIGHT DYNAMICS LAB., WRIGHT-PATTERSON AFB, OHIO.**  
Hypersonic technology-approach to an expanded program  
13 p0051 A77-14597
- AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.**  
An energy management guidance scheme applicable to the interim upper stage  
[AD-A034005] 15 p0353 N77-23143  
Analysis of the sun pumped laser cone optics  
[AD-A034284] 15 p0361 N77-24483
- AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA.**  
An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports  
[NASA-CR-2699] 13 p0083 N77-10033  
Assessment and study of existing concepts and methods of cryogenic refrigeration for superconducting transmission cables  
[COO-2552-6] 14 p0214 N77-18352
- AIRCO, INC., MURRAY HILL, N. J.**  
Comparative cost study of the processes for producing niobium-tin (Nb<sub>3</sub>Sn) superconducting tapes for their application to power transmission lines  
[ERDA-76-160] 15 p0387 N77-26999
- AIRSEARCH MFG. CO., PHOENIX, ARIZ.**  
Study of small turbofan engines applicable to single-engine light airplanes  
[NASA-CR-137944] 13 p0093 N77-11054  
Braxton isotope power system. Phase 1: (Ground demonstration system) Configuration Control Document (CCD)  
[TID-27252] 15 p0380 N77-26644  
Preliminary failure modes, effects and Criticality Analysis (PHECA) of the Brayton Isotope Power System (BIPS) ground demonstration system  
[TID-27301] 15 p0392 N77-27526
- ALABAMA POWER CO., BIRMINGHAM.**  
Impact of alternative energy forms on public utilities  
16 p0525 N77-30275
- ALABAMA UNIV., HUNTSVILLE.**  
Electric load management and energy conservation  
14 p0137 A77-20685  
Solar heating and cooling technical data and systems analysis  
[NASA-CR-150305] 15 p0378 N77-26611
- ALABAMA UNIV., UNIVERSITY.**  
Unit commitment in large power systems: Economic priorities of steam units and applications of pumped-storage generation  
16 p0545 N77-32588
- ALASKA CONSULTANTS, INC., ANCHORAGE.**  
A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2  
[PB-264706/3] 15 p0385 N77-26693
- ALASKA ENERGY OFFICE, JUNEAU.**  
Geothermal Energy and Wind Power: Alternate energy sources for Alaska  
[PB-261521/9] 15 p0349 N77-22678
- ALASKA UNIV., COLLEGE.**  
Geothermal Energy and Wind Power: Alternate energy sources for Alaska  
[PB-261521/9] 15 p0349 N77-22678  
Study of Alaskan wind power and its possible applications  
[NSF/RANN/SE/AER74-00239/FR-26] 15 p0382 N77-26664
- ALLIED CHEMICAL CORP., MORRISTOWN, N.J.**  
Hydrogen generation by photoelectrolysis of water  
14 p0240 N77-21605
- AMERICAN AIRLINES, INC., NEW YORK.**  
Future aircraft requirements: A notebook of airline thoughts  
13 p0117 N77-13976
- AMERICAN CYANAMID CO., BOUND BROOK, N. J.**  
Concept for fluidized bed combustion of Consol char using a closed-cycle helium power plant with an estimate of the price of electric power  
[ERDA-76-69] 13 p0130 N77-15506
- AMERICAN CYANAMID CO., STAMFORD, CONN.**  
Cadmium stannate selective optical films for solar energy applications  
[PB-254879/0] 13 p0090 N77-10678
- Cadmium stannate selective optical films for solar energy applications  
[PB-261850/2] 15 p0348 N77-22672
- AMERICAN INST. OF MINING, METALLURGICAL, AND PETROLEUM ENGINEERS, INC., WASHINGTON, D. C.**  
Proceedings of the Mineral Economics Symposium: Winning the high stakes at the critical commodity game  
[PB-255607/4] 13 p0105 N77-12502
- AMERICAN UNIV., WASHINGTON, D. C.**  
Research on electrochemical energy conversion systems  
[AD-A023689] 13 p0090 N77-10681  
Research on electrochemical energy conversion systems  
[AD-A034454] 15 p0367 N77-24632
- AMES LAB., IOWA.**  
Environmental effects of solid waste as a supplemental fuel  
[IS-3852] 14 p0211 N77-17567
- APPLIED NUCLEONICS CO., INC., LOS ANGELES, CALIF.**  
Proceedings of an EPRI Workshop on Technologies for Conservation and Efficient Use of Electric Energy. Volume 1: Overview  
[PB-261469/1] 14 p0230 N77-20577
- APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL, MD.**  
Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships  
[PB-255639/7] 13 p0109 N77-12552  
Maritime and construction aspects of Ocean Thermal Energy Conversion (OTEC) plant ships, detailed report  
[PB-257444/0] 13 p0116 N77-13554  
Design of an ocean thermal energy plant ship to produce ammonia via hydrogen  
14 p0237 N77-21564  
Internal heat transfer experiments in a simulated OTEC evaporator tube  
[APL/JHU/AEO-76-066] 16 p0521 N77-29611  
Energy programs at the Johns Hopkins University Applied Physics Laboratory  
[AD-A038096] 16 p0522 N77-29624
- APPLIED SYSTEMS CORP., VIENNA, VA.**  
The production and refining of crude oil into military fuels  
[AD-A024652] 13 p0095 N77-11207
- APPLIED URBANETICS, INC., WASHINGTON, D.C.**  
Vapor recovery analysis  
[PB-262846/9] 15 p0368 N77-24667
- ARTEC, INC., COLUMBIA, MD.**  
Tests of oil recovery devices in broken ice fields, phase 2  
[AD-A025748] 13 p0110 N77-12572
- ARGONNE NATIONAL LAB., ILL.**  
Explaining energy: A manual of non-style for the energy outsider who wants in  
[LBL-4458] 13 p0122 N77-14592  
Investment planning in the energy sector  
[LBL-4474] 13 p0125 N77-14948  
Development of nondestructive evaluation methods for coal-conversion systems  
[CONF-760472-2] 14 p0216 N77-18567  
High-performance batteries for off-peak energy storage and electric-vehicle propulsion  
[ANL-76-9] 14 p0223 N77-19621  
Applications and prospect of energy storage batteries  
[CONF-760416-2] 14 p0230 N77-20578  
Batteries for utility load leveling  
[CONF-760469-3] 14 p0231 N77-20579  
Fuel cell benefit analysis  
[ANL-ES-51] 14 p0232 N77-20593  
A thermodynamic analysis of HYCOSOS, a hydrogen conversion and storage system  
14 p0242 N77-21622
- Prisms with total internal reflection as solar reflectors  
[ANL-SOL-76-04] 15 p0345 N77-22629  
High-performance batteries for off-peak energy storage and electric-vehicle propulsion  
[ANL-76-81] 15 p0345 N77-22631  
Electric storage heating: The experience in England and Wales and in the Federal Republic of Germany  
[ANL-ES-50] 15 p0365 N77-24612  
Atmospheric impacts of evaporative cooling systems  
[ANL-ES-53] 15 p0367 N77-24643

Air pollution and the siting of fossil fuel power plants  
[ANL-76-IX-14] 15 p0386 N77-26708

Experimental two-phase liquid-metal magnetohydrodynamic generator program  
[AD-A035245] 15 p0387 N77-26988

Design problems associated with the use of evacuated glass receivers for solar collectors  
[CONF-7606128-1] 15 p0393 N77-27536

Instrumentation for measuring direct and diffuse insolation in testing thermal collectors  
[CONF-760832-23] 15 p0394 N77-27545

Assessment of energy storage technologies and systems. Phase 1: Electric storage heating, storage air conditioning, and storage hot water heaters  
[ANL-ES-54] 15 p0394 N77-27547

Overview of MINPACK  
[CONF-760842-19] 15 p0396 N77-27761

Tokamak experimental power reactor  
[CONF-761107-23] 15 p0397 N77-27946

Solar energy and electric utilities: Can they be interfaced?  
[ANL-ES-52] 16 p0515 N77-28601

The environmental effects of using coal for generating electricity  
[PB-267237/6] 16 p0524 N77-29655

Ceramic coatings for components exposed to coal-gas environments: A review  
[ANL-76-124] 16 p0532 N77-31323

Design and performance of Li-Al/iron sulfide cells for utility energy storage and electric vehicles  
[CONF-760617-3] 16 p0535 N77-31618

Cost estimation for a theta-pinch reactor  
[ANL-CTR-TH-40] 16 p0549 N77-32888

Strategies for commercializing customer thermal-energy storage  
[ANL-ES-55] 16 p0557 N77-33649

ARIZONA STATE UNIV., TEMPE.  
Energy in Perspective: An orientation conference for educators  
[CONF-760677] 15 p0373 N77-25648

Conversion of waste organic material to gasoline  
[COO-2982-7] 15 p0377 N77-26325

ARIZONA UNIV., TUCSON.  
A basis for analyzing prospective power generation in terms of environmental management and energy use  
13 p0096 N77-11526

Symposium on the Fundamental Optical Properties of Solids Relevant to Solar Energy Conversion  
[PB-256615/6] 13 p0108 N77-12538

Feasibility study of a nuclear power-sewage treatment system for the conservation and reclamation of water resources  
[PB-255630/6] 13 p0126 N77-14960

The optical properties of chromium oxide films and the high temperature stabilization of silver films for photothermal solar energy conversion  
13 p0128 N77-15484

Geothermal technoecosystems and water cycles in arid lands  
[PB-263091/1] 15 p0354 N77-23592

Investigation of high temperature performance of thin film, solar-thermal energy converters  
[PB-265554/6] 16 p0516 N77-28613

ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB., HANOVER, N. H.  
Concrete placing techniques used during the construction of the kasncysark hydroelectric power plant  
[AD-A026967] 13 p0121 N77-14528

Utility distribution systems in Iceland  
[AD-A026956] 13 p0126 N77-14957

Detecting structural heat losses with mobile infrared thermography. Part 4: Estimating quantitative heat loss at Dartmouth College, Hanover, New Hampshire  
[AD-A031803] 14 p0228 N77-20393

Demonstration of building heating with a heat pump using thermal effluent  
[AD-A041024] 16 p0530 N77-30631

ARMY CONSTRUCTION ENGINEERING RESEARCH LAB., CHAMPAIGN, ILL.  
Method for estimating solar heating and cooling system performance  
[AD-A026041] 13 p0116 N77-13557

Interim feasibility assessment method for solar heating and cooling of Army buildings  
[AD-A026588] 13 p0124 N77-14606

Predicting the performance of solar energy systems  
[AD-A035608] 15 p0373 N77-25660

Market evaluation study: Solar domestic water heaters for DOD barracks  
[AD-A036479] 16 p0516 N77-28611

Market evaluation study: Solar heating and domestic hot water heating in DOD buildings  
[AD-A042178] 16 p0546 N77-32597

ARMY ELECTRONICS COMMAND, FORT MONMOUTH, N. J.  
Composite material structures for thermophotovoltaic conversion radiator  
[AD-A026859] 13 p0132 N77-15519

A solar power radiometer  
[AD-A039995] 16 p0539 N77-31658

ARMY ELECTRONICS LABS., FORT MONMOUTH, N. J.  
Methanol-air batteries  
[AD-A035942] 15 p0375 N77-25675

ARMY ELECTRONICS TECHNOLOGY AND DEVICES LAB., FORT MONMOUTH, N. J.  
A half megawatt Pulse Forming Network (PFN)  
[AD-A039709] 16 p0526 N77-30373

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.  
Pollutant potential of raw and chemically fixed hazardous industrial wastes and flue gas desulfurization sludges  
[PB-256691/7] 13 p0133 N77-15540

ARMY FACILITIES ENGINEERING SUPPORT AGENCY, FORT BELVOIR, VA.  
Dual purpose nuclear power plants for military installations  
[AD-A026141] 13 p0132 N77-15521

ARMY MATERIALS AND MECHANICS RESEARCH CENTER, WATERTOWN, MASS.  
Ceramic materials and components for small automotive gas turbine engine  
[AD-A025472] 13 p0095 N77-11417

ARMY MATERIAL SYSTEMS ANALYSIS ACTIVITY, ABERDEEN PROVING GROUND, MD.  
Risk management of liquefied natural gas installations  
13 p0002 A77-10451

ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTER, FORT BELVOIR, VA.  
Surface research for development of new electrocatalysts for acid electrolyte fuel cells  
[AD-A026053] 13 p0131 N77-15517

An improved electrolyte for direct oxidation fuel cells  
[AD-A026164] 13 p0131 N77-15518

ARMY NITICK RESEARCH AND DEVELOPMENT COMMAND, MASS.  
Operation of military field heating equipment using solid fuels  
[AD-A037121] 15 p0388 N77-27152

ARMY TEST AND EVALUATION COMMAND, ABERDEEN PROVING GROUND, MD.  
Fuels and lubricants  
[AD-A032842] 15 p0359 N77-24314

ARMY WAR COLL., CARLISLE BARRACKS, PA.  
An analysis of the technology role in US power during the mid-range period  
[AD-A024042] 13 p0102 N77-11927

ASSOCIATION EURATOM-CEA, FONTENAY-AUX-ROSES (FRANCE).  
Review of the state of the art with Tokamaks in USSR  
[EUR-CEA-FC-839-TR] 16 p0541 N77-31981

ASSOCIATION OF PHYSICAL PLANT ADMINISTRATORS OF UNIV. AND COLL., WASHINGTON, D. C.  
Energy conservation on campus. Volume 1: Guidelines  
[PB-266211/2] 16 p0524 N77-29636

Energy conservation on campus. Volume 2: Case studies  
[PB-266212/0] 16 p0524 N77-29637

ATLANTIC RICHFIELD CO., HARVEY, ILL.  
Synthesis and analysis of jet fuel from shale oil and coal syncrudes  
[NASA-CR-135112] 13 p0103 N77-12230

ATLAS CORP., SANTA CLARA, CALIF.  
Description of the solar energy R and D programs in many nations  
[SAN/1122-76/1] 14 p0225 N77-19648

Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 1: Solar heating and cooling of buildings  
[PB-260594/7] 14 p0252 N77-21721

- Proceedings of First Semiannual EPRI Solar Program Review Meeting and Workshop. Volume 2: Solar electric power  
[PB-260555/4] 14 p0252 N77-21722
- ATOMIC ENERGY OF CANADA LTD., OTTAWA (ONTARIO).  
Research and development for Canadian nuclear power  
[AECL-5314] 13 p0097 N77-11533
- ATOMIC ENERGY ORGANIZATION OF IRAN, TEHRAN.  
Fusion. The future energy source  
[AEOL-10] 15 p0397 N77-27951
- ATOMIC INDUSTRIAL FORUM, INC., WASHINGTON, D. C.  
Role of nuclear power in meeting future U.S. energy needs  
[IAEA-CN-36/396] 16 p0560 N77-33677
- ATOMIC REACTOR CENTRE, BANDUNG (INDONESIA).  
Nuclear power aspects in an oil and coal producing country  
[IAEA-CN-36/175] 16 p0560 N77-33681
- ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.  
Hydration-dehydration cycling of MgO-Mg(OH)2 for application to solar heat storage systems  
[AI-ERDA-13178] 15 p0381 N77-26654
- Experimental test of gas heat transfer system for hydride heat storage  
[AI-ERDA-13176] 15 p0381 N77-26655
- Subsea nuclear power generating stations for offshore oil production operations.  
Preliminary safety and licensing information document  
[AI-ERDA-13193] 16 p0556 N77-33637
- AUBURN UNIV., ALA.  
Two investigations of flat-plate solar collector performance  
15 p0355 N77-23598
- AUTOMOTIVE TESTING LABS., INC., AURORA, COLO.  
An evaluation of high altitude engine modification devices (econo-kit)  
[PB-255556/3] 13 p0101 N77-11589
- AVCO-EVERETT RESEARCH LAB., EVERETT, MASS.  
CDIF combustor design  
[TID-27143] 15 p0377 N77-26393
- High power density MHD generators  
[AD-A038612] 15 p0397 N77-27983
- AYRA MEHR UNIV. OF TECHNOLOGY, TEHRAN (IRAN).  
An examination of the stirred reactor as a tool for the determination of rate constants of the H2-O2 combustion reactions  
14 p0245 N77-21644
- B**
- B & K ENGINEERING, INC., TOWSON, MD.  
Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512
- Development of a low temperature phase change material package  
[AIAA PAPER 77-762] 15 p0325 A77-39514
- BABCOCK AND WILCOX CO., ALLIANCE, OHIO.  
Investigating storage, handling, and combustion characteristics of solvent refined coal  
[PB-257557/9] 14 p0212 N77-17595
- BABCOCK AND WILCOX CO., BARBERTON, OHIO.  
Investigating storage, handling, and combustion characteristics of solvent refined coal  
[PB-257557/9] 14 p0212 N77-17595
- BAKER (MICHAEL, JR.) OF NEW YORK, INC., N. Y.  
Design guidelines for energy conserving systems  
[PB-268989/1] 16 p0559 N77-33670
- BALL STATE UNIV., MUNCIE, IND.  
An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator  
16 p0473 A77-48952
- The linear Fresnel lens solar concentrator:  
Transverse tracking error effects  
[NASA-CR-2889] 16 p0521 N77-29606
- Solar concentration by curved-base Fresnel lenses  
[NASA-CR-2890] 16 p0524 N77-29946
- BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD.  
Solar energy storage  
[AD-A026083] 14 p0213 N77-17605
- BARRY, (THEODORE) AND ASSOCIATES, LOS ANGELES, CALIF.  
A review of the solar array manufacturing industry costing standards  
[NASA-CR-153401] 16 p0528 N77-30608
- BATTELLE COLUMBUS LABS., OHIO.  
Energy: The policy planning framework in state governments. Volume 1: Summary report  
[PB-254466/6] 13 p0089 N77-10665
- Energy: The policy planning framework in state governments. Volume 2: Appendices  
[PB-254467/4] 13 p0089 N77-10666
- Chemical and physical characterization of automotive exhaust particulate matter in the atmosphere  
[PB-253375/0] 13 p0092 N77-10715
- Reductant gases for flue gas desulfurization systems  
[PB-254168/8] 13 p0092 N77-10722
- Fuel contaminants. Volume 1: Chemistry  
[PB-256020/9] 13 p0103 N77-12231
- Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays  
[NASA-CR-149451] 13 p0106 N77-12524
- Analysis of ceramic materials for impact members in isotopic heat sources  
[BHI-X-670] 14 p0210 N77-17246
- Systems study of fuels from sugar cane, sweet sorghum, and sugar beets  
[TID-27032] 14 p0211 N77-17570
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 6: Energy data and flow sheets, low-priority commodities)  
[PB-261150/7] 15 p0346 N77-22644
- Energy use patterns in metallurgical and nonmetallic mineral processing (Volume 1, Phase 9: Areas where alternative technologies should be developed to lower energy use in production of high-priority commodities), supplement  
[PB-261153/1] 15 p0346 N77-22645
- Combustion additives for pollution control: A state-of-the-art review  
[PB-264068/8] 15 p0359 N77-24316
- Destator test program evaluation  
[AD-A034260] 15 p0360 N77-24410
- Evaluation of methods for measuring and controlling hydrocarbon emissions from petroleum storage tanks  
[PB-262789/1] 15 p0371 N77-25551
- A summary of the DARPA energy and materials shortages programs, fiscal years 1972-1976  
[AD-A036021] 15 p0375 N77-25677
- Systems study of fuels from sugarcane, sweet sorghum, sugar beets, and corn  
[TID-27336] 15 p0377 N77-26324
- Evaluation of the potential environmental effects of wind energy system development  
[ERDA/NSF-07378/75/1] 15 p0382 N77-26663
- Factors affecting the corporate decisionmaking process of air transport manufacturers  
[NASA-CR-154618] 15 p0387 N77-27020
- Experimental screening of carbon-base materials for impact members in isotopic heat sources  
[BHI-X-673] 15 p0396 N77-27901
- Production and processing of US tar sands: An environmental assessment  
[PB-266266/6] 16 p0513 N77-28575
- Evaluation of the calcium aluminate bond phase in refractory castables as related to their use in synthane gasifier  
[PB-266854/9] 16 p0525 N77-30255
- Heat source component development program  
[BHI-X-676] 16 p0536 N77-31632
- Survey of the applications of solar thermal energy systems to industrial process heat. Volume 3: Solar thermal energy systems analysis and preliminary assessment of related nontechnical issues  
[TID-27348-VOL-3] 16 p0537 N77-31638
- Survey of the applications of solar thermal energy systems to industrial process heat. Volume 2: Industrial process heat survey  
[TID-27348-VOL-2] 16 p0537 N77-31639
- BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.  
Economics of geothermal electricity generation from hydrothermal resources  
[BNWL-1989] 13 p0123 N77-14602
- Precipitation scavenging of fossil-fuel effluents  
[PB-256649/5] 13 p0124 N77-14630
- Fusion energy option  
[BNWL-SA-5802] 14 p0213 N77-17891



- Flywheel-heat engine power for an energy-econoric personal vehicle  
[BNWL-2006] 14 p0214 N77-18448
- Ocean thermal energy conversion opportunities  
[BNWL-SA-5808] 14 p0217 N77-18581
- Potential national benefits of geothermal electrical energy production from hydrothermal resources in the West  
[BNWL-SA-5798] 14 p0220 N77-19583
- Potential benefits of geothermal electrical production from hydrothermal resources  
[BNWL-2001] 14 p0221 N77-19591
- Technical and economic feasibility analysis of the no-fuel compressed air energy storage concept  
[BNWL-2065] 14 p0225 N77-19643
- Geothermal water and gas: Collected methods for sampling and analysis: Comment issue  
[BNWL-2094] 14 p0249 N77-21679
- Potential for producing and marketing gasoline substitutes from western coal  
[BNWL-2080 (RAP-4)] 15 p0340 N77-22291
- User manual for GEOCOST: A computer model for geothermal cost analysis. Volume 2: Binary cycle version  
[BNWL-1942-V2] 15 p0345 N77-22632
- Influence of selected Federal statutes on energy development  
[BNWL-2084 (RAP-5)] 15 p0346 N77-22638
- Recommendations for a US geothermal research plan, volume 1  
[PB-261566/4] 15 p0346 N77-22640
- Recommendations for a US geothermal research plan. Volume 1: Appendix A: Glossary. Appendix B: Task analysis sheets  
[PB-261567/2] 15 p0346 N77-22641
- Recommendations for a US geothermal research plan. Volume 2: Executive summary  
[PB-261568/0] 15 p0346 N77-22642
- Recommendations for a geothermal utilization plan, Volume 3  
[PB-261569/8] 15 p0346 N77-22643
- The use of geothermal energy at military installations  
[AD-A034241] 15 p0366 N77-24626
- Measurement of dry deposition of fossil fuel plant pollutants  
[PB-264495/3] 15 p0376 N77-25685
- OTEC annual report to the Division of Solar Energy for FY-1976 and the transition quarter  
[BNWL-2154] 15 p0382 N77-26665
- Optimization technique for geothermal power plants using a binary fluid cycle  
[BNWL-2155] 15 p0394 N77-27546
- Modeling and optimization of geothermal power plants using the binary fluid cycle  
[BNWL-2112] 16 p0521 N77-29609
- Pacific northwest regional assessment program  
[BNWL-2084] 16 p0540 N77-31674
- Characterization of substances in products effluents and wastes from synthetic fuel production tests  
[BNWL-2131] 16 p0540 N77-31675
- Development and characterization of materials for open cycle MHD  
[BNWL-2004-3] 16 p0541 N77-31969
- ENFORM: An energy information system  
[BNWL-2195] 16 p0542 N77-32016
- Environmental cost/benefit analysis for fusion power plants  
[BNWL-2028] 16 p0549 N77-32893
- Current fusion power plant design concepts  
[BNWL-2013] 16 p0549 N77-32894
- Projected thermodynamic efficiencies of fusion power plants  
[BNWL-2017] 16 p0550 N77-32958
- BECHTEL CORP., SAN FRANCISCO, CALIF.  
Preliminary economics and comment: In-situ gasification of coal for power and SHG  
[PB-256034/0] 13 p0109 N77-12554
- Electric power generation using geothermal brine resources for a proof-of-concept facility  
[NSF/RA/N-75-049] 13 p0123 N77-14603
- Regional energy system for the planning and optimization of national scenarios (RESPONS). Clean coal energy: Source-to-use economics project  
[ERDA-76-109] 14 p0222 N77-19602
- Engineering design and cost analysis of chlorine storage concepts for a zinc-chlorine load-leveling battery  
[PB-262016/9] 14 p0252 N77-21727
- Evaluation of the technical and economic feasibility of mirror fusion devices  
[UCRL-13695] 15 p0386 N77-26977
- Engineering study of the module/array interface for large terrestrial photovoltaic arrays  
[ERDA/JPL-954698-77/1] 16 p0528 N77-30609
- Coal gasification study  
[AD-A041860] 16 p0554 N77-33615
- BILLINGS ENERGY RESEARCH CORP., PROVO, UTAH.  
Development of a low capital cost electrolyzer  
14 p0239 N77-21596
- Water induction in hydrogen-powered IC engines  
14 p0243 N77-21631
- Dynamic tests of hydrogen-powered IC engines  
14 p0244 N77-21633
- Prototype hydrogen automobile using a metal hydride  
14 p0244 N77-21636
- Automotive hydride tank design  
14 p0244 N77-21637
- A hydrogen-powered mass transit system  
14 p0244 N77-21638
- BOCHUM OBSERVATORY (WEST GERMANY).  
Remote sensing of geothermic activities of the volcanoes Aetna, Stromboli and Vesuv by means of infra-red NOAA-VHRR-satellite data  
13 p0104 N77-12485
- BOEING AEROSPACE CO., SEATTLE, WASH.  
Alternative approaches to space-based power generation  
14 p0199 N77-29066
- Space-based power conversion and power relay systems: Preliminary analysis of alternate systems  
[NASA-CR-150171] 14 p0207 N77-16447
- Innovative Aircraft Design Study (IADS) task 2, volume 1  
[AD-A041234] 16 p0531 N77-31141
- Review of electrochemical impregnation for nickel cadmium cells  
[NASA-CR-155155] 16 p0552 N77-33601
- BOEING CO., COCOA BEACH, FLA.  
Risk management of liquefied natural gas installations  
13 p0002 N77-10451
- BOEING CO., HOUSTON, TEX.  
Space solar power systems  
14 p0213 N77-17690
- BOEING CO., SEATTLE, WASH.  
Central receiver solar thermal power system. Collector subsystem research experiments  
[SAN/1111-76/2] 14 p0225 N77-19649
- Central receiver solar thermal power system, collector subsystem  
[SAN/1111-75/1] 14 p0230 N77-20576
- Advanced Thermal Energy Storage (TES) systems  
[EPRI-EM-256-SI] 16 p0555 N77-33622
- BOEING COMMERCIAL AIRPLANE CO., SEATTLE, WASH.  
An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports  
[NASA-CR-2699] 13 p0083 N77-10033
- Energy consumption characteristics of transports using the prop-fan concept  
[NASA-CR-137937] 13 p0118 N77-14029
- Energy consumption characteristics of transports using the prop-fan concept: Summary report  
[NASA-CR-137938] 13 p0118 N77-14030
- Fuel subsystem characteristics for LH2 aircraft  
14 p0243 N77-21630
- BOEING VERVOL CO., PHILADELPHIA, PA.  
Advanced helicopter structural design investigation. Volume 1: Investigation of advanced structural component design concepts  
[AD-A024662] 13 p0102 N77-12052
- Identifying and analyzing methods for reducing the energy consumption of helicopters  
[NASA-CR-144953A] 15 p0388 N77-27104
- BONNER AND MOORE ASSOCIATES, INC., HOUSTON, TEX.  
Crude supply alternatives for the Northern Tier states. Volume 1: Executive summary  
[PB-255992/0] 13 p0107 N77-12531

- Crude supply alternatives for the Northern Tier states. Volume 2: Technical report  
[PB-255993/8] 13 p0107 N77-12532
- Impact of fuel properties on jet fuel availability  
[AD-A029493] 14 p0219 N77-19278
- Overview and review of motor gasoline desulfurization, volume 1  
[BERC/RI-76/17-VOL-1] 16 p0551 N77-33377
- Motor gasoline desulfurization study, volume 2  
[BERC/RI-76/17-VOL-2] 16 p0551 N77-33378
- BONNEVILLE POWER ADMINISTRATION, PORTLAND, OREG.  
Proceedings of the 3rd Annual Energy Conservation Management Conference  
[PB-258652/7] 14 p0218 N77-18594
- BOOZ-ALLEN AND HAMILTON, INC., BETHESDA, MD.  
Procedures for feasibility analysis and preliminary design of total energy systems at military facilities  
[AD-A033756] 15 p0356 N77-23614
- BOOZ-ALLEN AND HAMILTON, INC., WASHINGTON, D. C.  
The effectiveness of solar energy incentives at the state and local level  
[PB-263371/7] 15 p0375 N77-25670
- BOOZ-ALLEN APPLIED RESEARCH, INC., BETHESDA, MD.  
Potential environmental impacts of solar heating and cooling systems  
[PB-259970/2] 14 p0226 N77-19683
- BOSCH (ROBERT) G.M.B.H., STUTTGART (WEST GERMANY).  
Manufacturing and evaluation of phthalocyanines as catalysts for fuel cells  
[BMFT-PB-T-76-25] 13 p0114 N77-13540
- BOSTON UNIV., MASS.  
Photochemical conversion of solar energy  
[PB-255703/1] 13 p0090 N77-10685
- Photochemical conversion of solar energy  
[PB-262450/0] 15 p0366 N77-24628
- Photon energy storage in organic materials: The case of linked anthracenes  
[AD-A039702] 16 p0535 N77-31615
- BRAUN (C. F.) AND CO., ALHAMBRA, CALIF.  
Coal gasification commercial concepts: Gas cost guidelines  
[PB-1235-1] 13 p0130 N77-15500
- BRISTOL UNIV. (ENGLAND).  
Analysis of steranes and triterpanes in geolipid extracts by automatic classification of mass spectra  
15 p0260 A77-31262
- BRITISH LIBRARY LENDING DIV., BOSTON SPA (ENGLAND).  
Investigation of the mechanism of cleaning heating surfaces by the pulsation method  
[BLL-M-25448-(5828.4F)] 13 p0112 N77-13235
- Method and equipment for the introduction of liquid waste fuels into a fluidized layer  
[BLL-RTS-10400] 15 p0359 N77-24205
- Economics and organization of metallurgical production: Effectiveness of the use of magnetic fields in melting alloy steels  
[BLL-M-25473-(5828.4F)] 15 p0359 N77-24245
- The turbo-generator with superconducting field winding in transient operation  
[BLL-RTS-10351] 15 p0360 N77-24381
- Determination of low activities of U-Ra-series elements by a liquid-scintillation spectrometer  
[BLL-SMRE-TRANS-6562-(8313.4)] 15 p0371 N77-25485
- BROOKHAVEN NATIONAL LAB., UPTON, N. Y.  
Closed Brayton cycle using hydrogen as a work fluid  
[BNL-20899] 13 p0085 N77-10542
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
[BNL-20877] 13 p0087 N77-10648
- Hydrogen for energy storage: A progress report of technical developments and possible applications  
[BNL-20931] 13 p0094 N77-11201
- Attic concentrator type solar energy collector  
[BNL-50493] 13 p0098 N77-11539
- Comparing the electric lead-acid battery vehicle with a hydrogen fueled vehicle incorporating an Fe-Ti hydride storage unit  
[BNL-20990] 14 p0211 N77-17577
- Relationship of energy growth to economic growth under alternative energy policies  
[BNL-50500] 14 p0223 N77-19620
- The 1985 technical coefficients for inputs to energy technologies  
[BNL-50532] 14 p0231 N77-20583
- Metal hydrides as hydrogen storage media and their applications  
[BNL-21648] 14 p0231 N77-20589
- Technical and economic aspects of potential US district heating systems  
[BNL-21287] 14 p0232 N77-20594
- Technical and economic feasibility of US district heating systems using waste heat from fusion reactors  
[BNL-50516] 14 p0232 N77-20606
- Dynamics systems analysis of the relation between energy and the economy  
[BNL-21667] 14 p0235 N77-20931
- Brookhaven superconducting cable test facility  
[BNL-21780] 14 p0236 N77-21331
- Studies of helical conductor models for superconducting ac power transmission  
[BNL-21784] 14 p0236 N77-21332
- Prospects for hydrogen production by water electrolysis to be competitive with conventional methods  
14 p0238 N77-21593
- The behavior of iron titanium hydride test beds: Long-term effects, heat transfer and modeling  
14 p0242 N77-21621
- Energy model data base program  
[BNL-21545] 14 p0250 N77-21687
- Concrete-polymer materials for geothermal applications  
[BNL-20865] 15 p0340 N77-22263
- Hydrogen storage, water electrolysis and fuel cells for electric energy storage  
[BNL-21498] 15 p0344 N77-22620
- Solid waste as an energy source for the northeast  
[BNL-50559] 15 p0352 N77-23012
- Future natural gas supply to the Northeast  
[BNL-50558] 15 p0364 N77-24595
- Planner's energy workbook: A users' manual for land use and energy utilization  
[BNL-21546] 15 p0364 N77-24596
- Alternative patterns of industrial energy consumption in the Northeast  
[BNL-50555] 15 p0364 N77-24597
- Future oil supply to the northeast United States  
[BNL-50557] 15 p0369 N77-24729
- Study to assess the application of shadow pricing techniques to national energy resource planning  
[BNL-50537] 15 p0369 N77-24997
- Economy-wide impacts of interfuel substitution: Substitution of electricity for imported oil  
[BNL-50538] 15 p0369 N77-24998
- Effects of alternative oil stockpiling programs on the US economy, 1976-1979  
[BNL-50541] 15 p0369 N77-24999
- Regional land use and energy modeling  
[BNL-21809] 15 p0378 N77-26595
- Energy situation in New England  
[BNL-50580] 15 p0381 N77-26650
- Oxidation of sulfur dioxide in power plant plumes  
[BNL-21698] 15 p0386 N77-26713
- Energy management in residential and small commercial buildings  
[BNL-50576] 15 p0392 N77-27511
- Briefing book on the energy situation in New England  
[BNL-21918] 16 p0515 N77-28599
- Hydrogen production and storage in utility systems  
[BNL-50590] 16 p0515 N77-28600
- Energetics of the United States of America: An atlas  
[BNL-50501] 16 p0522 N77-29615
- Input-Output capital coefficients for energy technologies  
[BNL-50608] 16 p0524 N77-30027
- Hydrogen-halogen energy storage system: Preliminary feasibility and economic assessment  
[BNL-22164] 16 p0537 N77-31635
- Energy Model Data Base (EMDB) using system 2000  
[BNL-21854] 16 p0541 N77-31814
- Power transmission project  
[BNL-22202] 16 p0551 N77-33426
- Role of renewable energy technologies in developing countries  
[BNL-22311] 16 p0556 N77-33638

**BROWN, BOVERI & CIE AKTIENGESELLSCHAFT, BADEN (SWITZERLAND).**

- Modern technology electrolysis for power application 14 p0239 N77-21598
- The Greenland hydropower as a source of electrolytic hydrogen 14 p0246 N77-21655

**BROWN UNIV., PROVIDENCE, R. I.**

- Assessment of cadmium sulfide photovoltaic arrays for large scale electric utility applications [PB-255646/2] 13 p0109 N77-12551

**BRUCKNER (K. A.) AND ASSOCIATES, INC., LA JOLLA, CALIF.**

- Assessment of laser-driven fusion [PB-260691/1] 14 p0234 N77-20880

**BUCKNELL UNIV., LEWISBURG, PA.**

- Performance limitations of silicon solar cells 15 p0257 A77-30711

**BUREAU OF MINES, AMARILLO, TEX.**

- Helium resources of the United States, 1973 [PB-252473/4] 13 p0085 N77-10623

- Analysis of natural gases, 1975 [PB-259351/5] 14 p0228 N77-20197

**BUREAU OF MINES, Bartlesville, OKLA.**

- Methanol as automotive fuel. Part 1: Straight methanol [CONF-750264-1] 15 p0389 N77-27246

**BUREAU OF MINES, COLLEGE PARK, MD.**

- Recycling trends in the United States: A review [PB-254222/3] 13 p0085 N77-10391

- An economic evaluation of a process to separate raw urban refuse into its metal, mineral, and energy components [PB-267629/4] 16 p0531 N77-31046

**BUREAU OF MINES, DENVER, COLO.**

- Projects to expand fuel sources in western states. Survey of planned or proposed coal oil shale, tar sand, uranium, and geothermal supply expansion projects, and related infrastructure, in states west of the Mississippi River (as of May 1976) [PB-265633/8] 16 p0516 N77-28614

- GDIST: A computer code for analysis of statistical distributions of physical data [PB-266762/4] 16 p0533 N77-31589

**BUREAU OF MINES, PITTSBURGH, PA.**

- Applying computer-drawn maps of geologic data to analysis of mining problems [PB-255497/0] 13 p0096 N77-11518

- Degasification and production of natural gas from an airshaft in the Pittsburgh coalbed [PB-258101/5] 14 p0210 N77-17555

- Projects to expand fuel sources in eastern states: Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976) [PB-262361/9] 15 p0374 N77-25669

- Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia [PB-266769/9] 16 p0527 N77-30589

- Computer graphics demonstration: Area coal availability studies [PB-267923/1] 16 p0541 N77-31824

**BUREAU OF MINES, SPOKANE, WASH.**

- Physical properties of western coal waste materials [PB-266724/4] 16 p0530 N77-30657

**BUREAU OF MINES, WASHINGTON, D. C.**

- Minerals in the US economy: Ten-year supply-demand profiles for mineral and fuel commodities [PB-252994/9] 13 p0085 N77-10624

- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts east of the Mississippi [PB-255176/0] 13 p0112 N77-13229

- Historical fuels and energy consumption data, 1960 - 1972, United States by states and census districts west of the Mississippi [PB-255177/8] 13 p0112 N77-13230

- Size distribution and mass output of particulates from diesel engine exhausts [PB-261416/2] 15 N77-22732

**Fuels and energy data: United States by states and census divisions, 1973**

- [PB-262362/7] 15 p0367 N77-24636

**BURNS AND ROE, INC., NEW YORK.**

- Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment [NASA-CR-134955] 15 p0380 N77-26637

**C****C-E POWER SYSTEMS, WINDSOR, CONN.**

- Laboratory analysis of solvent refined coal [PB-255550/6] 13 p0110 N77-12598

**CALGARY UNIV. (ALBERTA).**

- A consideration of catalytic effects on Pt-Pt/Rh thermocouples in combustion systems involving hydrogen as a fuel 14 p0245 N77-21645

**CALIFORNIA INST. OF TECH., PASADENA.**

- Technology of GaAs metal-oxide-semiconductor solar cells 15 p0259 A77-30739

**CALIFORNIA POLYTECHNIC STATE UNIV., SAN LOUIS OBISPO.**

- Research on the application of solar energy to the food drying industry [PB-267210/3] 16 p0530 N77-30635

**CALIFORNIA UNIV., BERKELEY.**

- Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems 15 p0337 A77-40028

- The formation of nitrogen oxides from fuel nitrogen [PB-252462/7] 13 p0092 N77-10717

- Use of electrical methods for the delineation of geothermal reservoirs [PB-261507/8] 15 p0351 N77-22750

- Energy recovery through biogasification of municipal solid wastes and utilization of thermal wastes from an energy-urban-agro-waste complex 15 p0358 N77-24008

- Large scale scientific computation via minicomputer [PB-267575/9] 16 p0541 N77-31824

**CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.**

- A linear economic model of fuel and energy use in the United States. Volume 1: Model Description and results [PB-252485/8] 13 p0088 N77-10662

- A linear economic model of fuel and energy in the United States. Volume 2: Submodels and data [PB-252486/6] 13 p0089 N77-10663

- Geothermal component test facility [TID-27035] 14 p0211 N77-17580

- Geothermal studies in northern Nevada [LBL-4451] 14 p0221 N77-19589

- Methods for geothermal reservoir detection emphasizing submerged environments [LBL-4495] 14 p0236 N77-21532

- Covered energy farms for solar energy conversion [LBL-4844] 14 p0248 N77-21671

- Resistance of superconducting-normal metal-superconducting sandwiches [LBL-5473] 15 p0341 N77-22393

- ERDA Interlaboratory Work for Data Exchange (INGDR) [LBL-5329] 15 p0352 N77-22998

- Results from circumsolar radiation measurements [LBL-5292] 15 p0382 N77-26657

- Conceptual design study for a laser fusion hybrid [UCRL-78682] 15 p0397 N77-27926

- Chromatographic determination of adsorption and diffusion in a bidispersed porous solid [LBL-5273] 16 p0532 N77-31269

- Analysis of the California energy industry [LBL-5928] 16 p0557 N77-33640

- Ecological considerations of the solar alternatives [LBL-5927] 16 p0558 N77-33655

**CALIFORNIA UNIV., DAVIS.**

- Land use, energy flow and policy making in society. SINPAC handbook. A guide to the modeling of socio-economic phenomena [PB-267134/5] 16 p0530 N77-30637

- Health effects of pollutants associated with fossil-fuel power generation: An indexed bibliography with abstracts  
[UCD-472-500] 16 p0540 N77-31672
- CALIFORNIA UNIV., IRVINE.  
JP-4 and JP-9 fuel toxicity studies using water fish and aufwuchs  
[AD-A027594] 13 p0127 N77-15213
- CALIFORNIA UNIV., LA JOLLA.  
The Tethered Balloon Current Generator - A space shuttle-tethered subsatellite for plasma studies and power generation 14 p0184 A77-26200
- CALIFORNIA UNIV., LIVERMORE. LAWRENCE LIVERMORE LAB.  
Will the large-scale production of hydrogen be part of the energy problem or part of its solution  
[UCRL-76844] 13 p0087 N77-10652
- Underground fuel gasification  
[UCRL-TRANS-10998] 13 p0088 N77-10659
- Methods in environmental sampling for radionuclides  
[UCRL-77722] 13 p0091 N77-10697
- Draft environmental assessment of application by ERDA for a special land use permit for use of public lands in Wyoming for in situ coal gasification experiments  
[UCID-17011] 13 p0100 N77-11572
- Flat-plate solar collector handbook. A survey of principles, technical data and evaluation results  
[UCID-17C86] 13 p0105 N77-12506
- California energy outlook  
[UCRL-5196-REV-1] 13 p0106 N77-12525
- Monitoring fluid flow by using high-frequency electromagnetic probing  
[UCRL-51979] 13 p0120 N77-14393
- Hybrid drive with kinetic energy store as vehicle drive  
[UCRL-TRANS-11018] 13 p0120 N77-14486
- Reactivity of oil shale carbonaceous residue with oxygen and carbon dioxide  
[UCRL-77829] 13 p0123 N77-14596
- LLS-Sohio solar process heat project. Report no. 3: LLS solar energy group  
[UCID-16630-3] 13 p0123 N77-14604
- Industrial process heat from shallow solar ponds  
[UCRL-77801] 13 p0124 N77-14611
- Pyrolysis of oil shale: The effects of thermal history on oil yield  
[UCRL-77831] 13 p0129 N77-15499
- Energy and technology review  
[UCRL-52000-76-2] 13 p0131 N77-15508
- Overview of the Imperial Valley environmental project  
[UCID-17C67] 13 p0132 N77-15533
- Performance test of a bladeless turbine for geothermal applications  
[UCID-17068] 14 p0212 N77-17581
- Geology and potential uses of the geopressure resources of the Gulf Coast  
[UCID-17163] 14 p0215 N77-18562
- Development scenario for laser fusion  
[UCRL-76980] 14 p0216 N77-18575
- Supply and demand of fuel sources for automobiles  
[UCRL-78066] 14 p0219 N77-19275
- Methanol engine: A transportation strategy for the post-petroleum era  
[UCRL-52041] 14 p0219 N77-19469
- Helical-rotor expander applications for geothermal energy conversion  
[UCRL-52043] 14 p0221 N77-19586
- Investigation of heat exchanger flow arrangement on performance and cost in a geothermal binary cycle  
[UCRL-78390] 14 p0221 N77-19587
- Status report: Lawrence Livermore Laboratory wind energy studies  
[UCID-17157-1] 14 p0221 N77-19588
- Modular 5 MW geothermal power plant design considerations and guidelines  
[UCRL-13684] 14 p0222 N77-19612
- Changing energy perspectives  
[UCRL-78153] 14 p0223 N77-19626
- Composite fiber flywheel for energy storage  
[UCRL-78C85] 14 p0225 N77-19645
- Battery-flywheel hybrid electric power system for near term application. Volume 2: System design  
[UCID-17098-VOL-2] 14 p0228 N77-20443
- Solar energy: L-division miscellaneous  
[UCID-17177] 14 p0231 N77-20590
- Solar industrial steam  
[UCRL-77895] 14 p0231 N77-20592
- Simple home heating system (what can be done now)  
[UCRL-77875] 14 p0232 N77-20598
- Shallow solar ponds for industrial process heat: The ERDA-SOHIO project  
[UCRL-78288] 14 p0232 N77-20601
- Hydrogen energy: Its potential promises and problems 14 p0246 N77-21648
- Will the large-scale production of hydrogen be part of the energy problem or part of its solution? 14 p0246 N77-21654
- Wind power studies: Field measurement priorities for numerical analysis of wind energy  
[UCRL-50034-76-3] 14 p0249 N77-21681
- Mirror hybrid reactor optimization studies  
[UCRL-78614] 14 p0253 N77-21939
- Energy and technology review  
[UCRL-52000-76-8] 15 p0345 N77-22627
- Fiber composite program for flywheel applications  
[UCRL-50033-76-1] 15 p0345 N77-22633
- Field-reversed mirror as a D-T power reactor  
[UCRL-78082] 15 p0351 N77-22967
- The 120-keV beam direct conversion system for TPTR injectors  
[UCRL-52137] 15 p0355 N77-23610
- Research leading to the production and early use of numeric data banks of material properties and system analyses  
[UCRL-50038-76-2] 15 p0364 N77-24601
- United States special format report: Performance of the Sohio Solar Water Heating System using large area plastic collectors (Grants, New Mexico)  
[SAN/1038-76/1] 15 p0365 N77-24606
- Energy and resource planning group  
[UCRL-50029-76] 15 p0372 N77-25634
- Will a rapidly expanding power-generating system be part of the energy problem or part of its solution  
[UCRL-78500] 15 p0381 N77-26651
- Temperature dependence of the photovoltaic performance of Si cells under blue, white, and near-bandgap irradiation  
[UCRL-76203] 15 p0381 N77-26652
- Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 1: Digest of detailed data base descriptions  
[UCID-17316-PT-1] 15 p0387 N77-27036
- Transportation-related data bases extracted from the national index of energy and environmental data bases. Part 2: Detailed data base descriptions  
[UCID-17316-PT-2] 15 p0387 N77-27037
- Wind power studies: Regional wind energy measurements  
[UCRL-50034-76-4] 15 p0392 N77-27527
- Hydrogen storage by binary and ternary intermetallics for energy applications: A review  
[UCRL-52110] 15 p0394 N77-27548
- Energy and technology review  
[UCRL-52000-76-11] 15 p0396 N77-27651
- Hawaii technology utilization experiment  
[UCID-17343] 15 p0398 N77-28038
- Biosolar production of fuels from algae  
[UCRL-52177] 16 p0511 N77-28323
- Biosolar synfuels for transportation  
[UCRL-52208] 16 p0514 N77-28593
- Optimal design of anisotropic (fiber-reinforced) flywheels  
[UCRL-52169] 16 p0522 N77-29616
- Environmental effects of energy production and utilization in the US. Volume 1: Sources, trends and costs of control  
[UCRL-51930-VOL-1] 16 p0530 N77-30645
- Oil, gas, uranium, and thorium: Supply and depletion, with special reference to California  
[UCRL-52180] 16 p0536 N77-31628

- US energy flow in 1976  
[UCID-17443] 16 p0557 N77-33639
- CALIFORNIA UNIV., LOS ANGELES.  
Thermal alteration of young kerogen in relation  
to petroleum genesis 13 p0053 A77-15044
- Crash test of a liquid hydrogen automobile 15 p0282 A77-33397
- Thermal alteration experiments on organic matter  
from recent marine sediments in relation to  
petroleum genesis 15 p0298 A77-36254
- Excess liquid in heat-pipe vapor spaces  
[AIAA PAPER 77-748] 15 p0311 A77-37261
- Methods of on-board generation of hydrogen for  
vehicular use 14 p0242 N77-21617
- Crash test of a liquid hydrogen automobile 14 p0244 N77-21635
- Transparent glass honeycomb structures for  
energy loss control 14 p0248 N77-21673
- [SAW/1084-75/1] 14 p0248 N77-21673
- A parametric utility comparison of coal and  
nuclear electricity generation 16 p0523 N77-29634
- [PB-26664/5] 16 p0523 N77-29634
- CALIFORNIA UNIV., RIVERSIDE.  
Cooperative geochemical resource assessment of  
the Mesa Geothermal system 13 p0132 N77-15520
- [PB-257225/3] 13 p0132 N77-15520
- Petrology and geochemistry of hydrothermal  
alteration in borehole Mesa 6-2, East Mesa  
geothermal area, Imperial Valley, California  
[PB-258871/3] 14 p0215 N77-18541
- On shallow-hole temperature measurements. A  
test study in the Salton Sea geothermal field  
[PB-262643/0] 15 p0343 N77-22602
- Telluric mapping over the Mesa Geothermal  
Anomaly, Imperial Valley, California  
[PB-262828/7] 15 p0355 N77-23593
- Energy in an oasis: Geothermal resource  
development in the Imperial Valley of California  
16 p0552 N77-33598
- CALIFORNIA UNIV., SANTA CRUZ.  
Proceedings of a Symposium on Offshore Oil  
Potential and Related Land Use Impacts in the  
Central California Coastal Zone  
[PB-259074/3] 14 p0215 N77-18547
- CARNEGIE-MELLON UNIV., PITTSBURGH, PA.  
Heterojunctions in photovoltaic devices  
14 p0162 A77-22977
- Efficiency calculations for Al<sub>x</sub>Ga<sub>1-x</sub>As-GaAs  
heteroface solar cells 15 p0257 A77-30720
- Catalytic synthesis of gaseous hydrocarbons  
[PE-1814-2] 13 p0130 N77-15503
- Design and modeling of solar sea power plants by  
geometric programming 14 p0231 N77-20585
- [COO-2895-T1] 14 p0231 N77-20585
- CASE WESTERN RESERVE UNIV., CLEVELAND, OHIO.  
Materials research and evaluation for geothermal  
corrosion environments 14 p0210 N77-17216
- [COO-2602-2] 14 p0210 N77-17216
- Hydrogen sulfide stress corrosion cracking in  
materials for geothermal power 16 p0519 N77-29269
- [COO-2576-3] 16 p0519 N77-29269
- CENTER FOR ENERGY AND ENVIRONMENT RESEARCH, CAPARRA  
HEIGHTS (PUERTO RICO).  
Ecological review of hydroelectric reservoirs in  
Puerto Rico 16 p0540 N77-31673
- [CEER-1] 16 p0540 N77-31673
- CENTER FOR THE ENVIRONMENT AND MAN, INC., HARTFORD,  
CONN.  
Regional variations of solar radiation with  
application to solar energy system design  
[PB-259379/6] 14 p0226 N77-19708
- Regional variations of solar radiation with  
application to solar energy system design,  
user's manual 14 p0234 N77-20676
- [PB-259378/8] 14 p0234 N77-20676
- CENTRAL TECHNICAL INST. TWO, APELDOORN (NETHERLANDS).  
Hydrogen combustion. Part 1: Investigation of  
hydrogen flame control methods 14 p0235 N77-21204
- [CTI-IV-75-01449] 14 p0235 N77-21204
- CENTRE NATIONAL D'ETUDES SPATIALES, TOULOUSE  
(FRANCE).  
Testing and fabrication of solar absorbers for  
the D5A satellite 13 p0111 N77-13110
- [CNES-WT-37] 13 p0111 N77-13110
- CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE,  
MARSEILLES (FRANCE).  
Optical study of fixed spherical solar collectors  
[LAS-PRC-76-01] 15 p0373 N77-25653
- CHAMBERLAIN MFG. CO., WATERLOO, IOWA.  
Considerations in the development of a high  
performance per unit cost solar collector 16 p0487 A77-49067
- CHARLES RIVER ASSOCIATES, INC., CAMBRIDGE, MASS.  
Long-range forecasting properties of  
state-of-the-art models of demand for electric  
energy. Volume 2: Annotated bibliography  
[PB-261766/0] 14 p0251 N77-21718
- CHEM SYSTEMS, INC., NEW YORK.  
Liquid phase methanol 14 p0212 N77-17594
- [PB-257615/5] 14 p0212 N77-17594
- CHEMTRIC, INC., ROSEMONT, ILL.  
Developing and testing of a wastewater recycler  
and heater 16 p0531 N77-31040
- [NASA-CR-154846] 16 p0531 N77-31040
- CHICAGO UNIV., ILL.  
Solar energy concentration 14 p0220 N77-19584
- [COO-2446-7] 14 p0220 N77-19584
- Air pollution and the siting of fossil fuel  
power plants 15 p0386 N77-26708
- [ANL-76-XI-14] 15 p0386 N77-26708
- CHRYSLER CORP., DETROIT, MICH.  
Baseline gas turbine development program 15 p0390 N77-27410
- [COO-2749-15] 15 p0390 N77-27410
- CLEMSON UNIV., S.C.  
Effects of thermal pollution on certain aquatic  
invertebrates 15 p0368 N77-24673
- [PB-263488/9] 15 p0368 N77-24673
- COAST GUARD, WASHINGTON, D.C.  
An assessment of wind-powered generators for  
navigational aids 16 p0468 A77-48900
- COAST GUARD RESEARCH AND DEVELOPMENT CENTER,  
GROTON, CONN.  
Laboratory evaluation of solar power units for  
marine aids to navigation 15 p0375 N77-25672
- [AD-A034567] 15 p0375 N77-25672
- COASTAL ENVIRONMENTS, INC., BATON ROUGE, LA.  
A process for coastal resource management and  
impact assessment 15 p0376 N77-26004
- [PB-264811/1] 15 p0376 N77-26004
- COLORADO ENERGY RESEARCH INST., GOLDEN.  
Net energy analysis: An energy balance study of  
fossil fuel resources 14 p0225 N77-19657
- [PB-259158/4] 14 p0225 N77-19657
- Net energy analysis: An energy balance study of  
fossil fuel resources. Summary report 14 p0225 N77-19658
- [PB-259159/2] 14 p0225 N77-19658
- COLORADO SCHOOL OF MINES, GOLDEN.  
Geothermal exploration: An evaluation of the  
microseismic groundnoise method 15 p0343 N77-22603
- [PB-262575/4] 15 p0343 N77-22603
- COLORADO SPRINGS DEPT. OF PUBLIC UTILITIES, COLO.  
Assessment of a single-family residence solar  
heating system in a suburban development  
setting. Project Phoenix 16 p0530 N77-30632
- [PB-263192/7] 16 p0530 N77-30632
- COLORADO STATE UNIV., FORT COLLINS.  
Energy storage possibilities of atomic hydrogen 15 p0283 A77-33405
- [COO-2577-10] 15 p0283 A77-33405
- Evaluation of the solar heating system in the  
Lof residence, Denver, Colorado 14 p0233 N77-20617
- [PB-258845/7] 14 p0233 N77-20617
- Design, construction, and testing of a  
residential solar heating and cooling system 14 p0248 N77-21670
- [COO-2577-10] 14 p0248 N77-21670
- An investigation of electrohydrodynamic heat pipes  
[NASA-CR-151977] 15 p0342 N77-22422
- Comparative performance of solar heating with  
air liquid systems 15 p0383 N77-26676
- [COO-2868-1] 15 p0383 N77-26676
- Cooling subsystem design in CUS solar house 3  
[COO-2858-1] 16 p0514 N77-28592
- [COO-2858-1] 16 p0514 N77-28592
- COLORADO UNIV., BOULDER.  
Applied research in the general area of charged  
particle chemistry related to coal-fired MHD  
[PB-263873/2] 15 p0387 N77-26987
- Computer simulation of geothermal reservoirs  
[PB-265104/0] 15 p0395 N77-27564
- [PB-265104/0] 15 p0395 N77-27564
- COLUMBIA UNIV., NEW YORK.  
Resource recovery technology for urban  
decision-makers 13 p0093 N77-10964
- [PB-252458/5] 13 p0093 N77-10964

COMBUSTION ENGINEERING-LUNNUS, BLOOMFIELD, N. J.  
Technoeconomic analysis of large scale  
thermonuclear production of hydrogen  
[EPRI-EH-287] 16 p0532 N77-31336

COMMERCE DEPT., WASHINGTON, D.C.  
Energy requirements for air pollution control in  
the primary aluminum industry  
[PB-264483/9] 15 p0375 N77-25684  
Forecast of likely US energy supply/demand  
balances for 1985 and 2000, and implications  
for US energy policy  
[PB-266240/1] 16 p0523 N77-29633

COMMISSION OF THE EUROPEAN COMMUNITIES, BRUSSELS  
(BELGIUM).  
JET project (design proposal)  
[EUR-5516] 16 p0549 N77-32914

COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES (U.  
S. SENATE).  
Alternative fuels for aviation  
[GPO-78-544] 13 p0127 N77-15212  
Aircraft fuel efficiency program  
[S-REPT-94-633] 14 p0209 N77-17032

COMMITTEE ON COMMERCE (U. S. SENATE).  
Oversight hearings on the SST  
[GPO-76-492] 15 p0376 N77-26107

COMMITTEE ON ENERGY AND NATURAL RESOURCES (U. S.  
SENATE).  
The President's energy program  
[GPO-88-556] 16 p0552 N77-33599

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE (U.  
S. HOUSE).  
PEA: Final reports on oil and gas resources,  
reserves, and productive capacities  
[GPO-80-748] 16 p0534 N77-31606  
Compilation of energy-related legislation.  
Volume 1: Oil, gas, and electric power  
[GPO-80-323] 16 p0534 N77-31608  
Compilation of energy-related legislation.  
Volume 2: Other energy legislation  
[GPO-80-324] 16 p0534 N77-31609

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION (U. S.  
HOUSE).  
Aviation economics  
[GPO-73-830] 15 p0352 N77-23008

COMMITTEE ON SCIENCE AND TECHNOLOGY (U. S. HOUSE).  
Inventory of energy research and development  
(1973 - 1975), volume 1  
[GPO-64-734-VOL-1] 13 p0113 N77-13525  
Inventory of energy research and development  
(1973 - 1975), volume 2  
[GPO-64-734-VOL-2] 13 p0113 N77-13526  
Inventory of energy research and development  
(1973 - 1975), volume 3  
[GPO-64-734-VOL-3] 13 p0113 N77-13527  
Inventory of energy research and development  
(1973 - 1975), volume 4  
[GPO-64-734-VOL-4] 13 p0113 N77-13528  
Inventory of energy research and development  
(1973 - 1975), volume 5  
[GPO-64-734] 13 p0121 N77-14579  
Polar energy resources potential  
[GPO-76-187] 16 p0520 N77-29605  
NASA authorization, 1978, volume 1, part 2  
[GPO-92-082] 16 p0542 N77-32031  
NASA authorization, 1978, volume 1, part 3  
[GPO-92-294] 16 p0542 N77-32032

COMMITTEE ON THE BUDGET (U.S. HOUSE).  
Economic and budget impact of the President's  
energy proposals  
[GPO-93-689] 16 p0534 N77-31607

COMMITTEE ON THE JUDICIARY (U. S. HOUSE).  
Energy industry investigation. Part 1: Joint  
ventures  
[GPO-72-530] 15 p0391 N77-27499  
Energy industry investigation. Part 2:  
Industry structure  
[GPO-83-695] 15 p0391 N77-27500

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH  
ORGANIZATION, MELBOURNE (AUSTRALIA).  
Progress report on the performance of three  
Australian solar hot water systems  
[SES-8] 15 p0364 N77-24604

CONGRESSIONAL BUDGET OFFICE, WASHINGTON, D. C.  
Energy research: Alternative strategies for  
development of new energy technologies and  
their implications for the Federal budget  
[PAPER-10] 15 p0372 N77-25632

COORDINATING RESEARCH COUNCIL, INC., NEW YORK.  
Cooperative study of heavy duty diesel emission  
measurement methods  
[PB-257137/0] 13 p0133 N77-15541

CORNELL UNIV., ITHACA, N. Y.  
User's guide to petroleum industry survey data  
type  
[PB-256635/4] 13 p0098 N77-11544  
Reciprocating pump for conversion of liquid  
hydrogen to high pressure gaseous hydrogen  
14 p0245 N77-21647  
Bioconversion of agricultural wastes for  
pollution control and energy conservation  
[TID-27164] 15 p0383 N77-26675

COUNCIL OF ECONOMIC ADVISORS, WASHINGTON, D. C.  
Report of the Presidential task force on reform  
of Federal Energy Administration regulations,  
volume 1  
[PB-262181/1] 15 p0347 N77-22649  
Report of the Presidential task force on reform  
of Federal Energy Administration regulations,  
volume 2. Table of contents. Appendixes  
[PB-262182/9] 15 p0347 N77-22650

CURTISS-WRIGHT CORP., WOOD-RIDGE, N.J.  
Performance, emissions, and physical  
characteristics of a rotating combustion  
aircraft engine  
[NASA-CR-135119] 15 p0376 N77-26134

## D

DAMES AND MOORE, ANCHORAGE, ALASKA.  
Alaska OCS socioeconomic studies program,  
literature survey  
[PB-269244/0] 16 p0549 N77-32681

DARCOM INTERN TRAINING CENTER, TEXARKANA, TEX.  
The feasibility of solar energy usage on Red  
River Army Depot  
[AD-A025119] 13 p0108 N77-12535

DARTMOUTH COLL., HANOVER, N.H.  
Long-term natural resource availability:  
Environmental and political implications in  
the United States  
[PB-265762/5] 16 p0511 N77-28327

DATA RESOURCES, INC., LEXINGTON, MASS.  
Residential demand for energy, volume 1  
[EPRI-EA-235-VOL-1] 16 p0530 N77-30629

DEFENCE RESEARCH ESTABLISHMENT OTTAWA (ONTARIO).  
A computer program to calculate and plot  
wind-generated stored energy at constant  
consumption  
[AD-A029977] 15 p0356 N77-23613

DEFENSE DOCUMENTATION CENTER, ALEXANDRIA, VA.  
Solar cells and solar panels  
[AD-A039100] 16 p0529 N77-30621

DEFENSE INTELLIGENCE AGENCY, WASHINGTON, D.C.  
Electric vehicle research, development and  
technology - foreign  
[AD-A036458] 16 p0512 N77-28419  
Electric vehicle research, development, and  
technology, foreign  
[AD-A040526] 16 p0542 N77-32034

DELAWARE UNIV., NEWARK.  
Theoretical prospects of the CdS-Cu<sub>2</sub>S solar cell  
[PB-252409/8] 13 p0089 N77-10672  
Direct solar energy conversion for large scale  
terrestrial use  
[PB-252539/2] 13 p0089 N77-10674

DEMETROULIS (NICHOLAS H.) AND ASSOCIATES,  
ALEXANDRIA, VA.  
Technical review and analysis of the total  
utility demonstration plant design and  
operational concept  
[AD-A037016] 15 p0398 N77-28040

DENVER RESEARCH INST., COLO.  
Two-phase flow in geothermal energy sources  
[TID-27129] 14 p0250 N77-21689  
Space benefits: The secondary application of  
aerospace technology in other sectors of the  
economy  
[NASA-CR-152685] 15 p0352 N77-23010

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,  
WASHINGTON, D. C.  
Buying solar  
[PB-262134/0] 15 p0348 N77-22673  
The marketability of integrated energy/utility  
systems  
[PB-266042/1] 16 p0523 N77-29626

- Integrated utility systems: Feasibility study and conceptual design at the University of Florida  
[PB-266043/9] 16 p0523 N77-29627
- Integrated utility systems: Feasibility study and conceptual design at Central Michigan University  
[PB-266044/7] 16 p0523 N77-29628
- DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WASHINGTON, D. C.  
Rapid growth from energy projects: Ideas for state and local action. A program guide  
[PB-257374/9] 13 p0132 N77-15527
- DEPARTMENT OF TRANSPORTATION, WASHINGTON, D. C.  
Analysis of fiscal year 1977 DOT program by policy and RD and D management objectives. Program levels for fiscal years 1975, 1976, 1977, volume 1  
[PB-255401/2] 13 p0117 N77-13922
- DEPUTY CHIEF OF STAFF FOR RESEARCH DEVELOPMENT AND ACQUISITION (ARMY), WASHINGTON, D.C.  
Report of the Army Scientific Advisory Panel Ad Hoc Group on fire-safe fuels  
[AD-A023763] 13 p0095 N77-11208
- DETROIT DIESEL ALLISON, INDIANAPOLIS, IND.  
Study and program plan for improved heavy duty gas turbine engine ceramic component development  
[NASA-CR-135230] 16 p0542 N77-32033
- DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, LANFOLDSHAUSEN (WEST GERMANY).  
Production of chemical energy carriers by non-expandable energy sources  
[DLR-FB-76-32] 13 p0114 N77-13541
- DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, OBERPFAPFENHOFFEN (WEST GERMANY).  
Mathematical simulation and empirical determination of the aerochemical and thermal atmospheric pollution resulting from energy conversion processes  
[DLR-IB-553-75/1] 13 p0091 N77-10700
- DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, STUTTGART (WEST GERMANY).  
The cylindrical parabolic mirror as reflector for solar collectors. Efficiencies and optimization  
[DLR-FB-76-55] 14 p0233 N77-20607
- A system consideration of the cryogenic storage tank for liquid hydrogen fueled vehicles and the resulting tank concept for a passenger car  
14 p0240 N77-21612
- On the storage of hydrogen by use of cryo-adsorbents  
14 p0245 N77-21646
- DGS ASSOCIATES, INC., WASHINGTON, D. C.  
The reporting of federal research and development resources applied to innovation  
[PB-266765/7] 16 p0541 N77-32009
- DIRECTION DES ETUDES ET TECHNIQUES NOUVELLES (FRANCE).  
Thermodynamics of thermochemical water decomposition processes  
14 p0238 N77-21574
- DORNIER-SYSTEM G.M.B.H., FRIEDRICHSHAFEN (WEST GERMANY).  
Development of a vertical axis wind turbine (phase 1)  
[BMFT-FB-T-76-55] 14 p0209 N77-17112
- DOUGLAS AIRCRAFT CO., INC., LONG BEACH, CALIF.  
Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 1: Technical analysis  
[NASA-CR-137923] 15 p0353 N77-23072
- Cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system. Volume 2: Market and economic analyses  
[NASA-CR-137924] 15 p0353 N77-23073
- DOW CHEMICAL CO., FREEPORT, TEX.  
Environmental assessment of geopressured waters and their projected uses  
[PB-268289/6] 16 p0544 N77-32579
- DOW CHEMICAL CO., MIDLAND, MICH.  
Solar energy subsystems employing isothermal heat sink materials  
[PB-258738/4] 14 p0233 N77-20616
- DOW CORNING CORP., HENLOCK, MICH.  
Research and development of low cost processes for integrated solar arrays  
[COO-2721-76-1] 15 p0383 N77-26670
- Solar silicon via improved and expanded metallurgical silicon technology  
[NASA-CR-153415] 16 p0528 N77-30606
- DRAVO CORP., PITTSBURGH, PA.  
Handbook of gasifiers and gas treatment systems  
[PE-1772-11] 13 p0088 N77-10658
- DREXEL UNIV., PHILADELPHIA, PA.  
Assessment of power system security under load uncertainty  
13 p0112 N77-13324
- Thermodynamic analysis of an oil reclamation process  
[PB-268524/6] 16 p0548 N77-32614
- DSS ENGINEERS, INC., FORT LAUDERDALE, FLA.  
Preliminary research on ocean energy industrial complexes, phase 1  
[ORO-4915-3] 14 p0248 N77-21669
- DU PONT DE NEMOURS (E. I.) AND CO., WILMINGTON, DEL.  
Economic feasibility: Fuel grade methanol from coal  
[TID-27156] 15 p0345 N77-22630
- DUBIN-MINDELL-BLOOM ASSOCIATES, NEW YORK.  
New energy conservation ideas for existing and new buildings  
[CONF-750942-2] 15 p0382 N77-26660
- DUKE UNIV., DURHAM, N. C.  
A theory of control for a class of electronic power processing systems: Energy-storage dc-to-dc converters  
[NASA-CR-152696] 15 p0344 N77-22614
- DYNATHERM CORP., COCKEYSVILLE, MD.  
Development of a jet pump-assisted arterial heat pipe  
[NASA-CR-152015] 16 p0527 N77-30415
- E**
- EARTH SATELLITE CORP., WASHINGTON, D. C.  
Application of LANDSAT-2 data to the implementation and enforcement of the Pennsylvania Surface Mining Conservation and Reclamation Act  
[E77-10007] 13 p0085 N77-10590
- ECON, INC., PRINCETON, N. J.  
The economic viability of pursuing a space power system concept  
[AIAA PAPER 77-353] 13 p0066 A77-18258
- Satellite solar power - Will it pay off  
[AIAA 77-1027] 16 p0404 A77-41567
- Space power system design and development from an economic point of view  
16 p0464 A77-48872
- SEASAT - A candidate ocean industry economic verification experiments  
[NASA-CR-149228] 13 p0104 N77-12476
- Space-based solar power conversion and delivery systems study. Volume 1: Executive summary  
[NASA-CR-150146] 13 p0129 N77-15494
- Space-based solar power conversion and delivery systems study. Volume 3: Economic analysis of space-based solar power systems  
[NASA-CR-150148] 13 p0129 N77-15496
- An evaluation of SEASAT-A candidate ocean industry economic verification experiments  
[NASA-CR-153009] 15 p0361 N77-24561
- ECONOMIC RESEARCH SERVICE, WASHINGTON, D. C.  
Energy and US agriculture. 1974 data base, volume 1. Part A: US series of energy tables. Part B: State series of energy tables  
[PB-264449/0] 15 p0395 N77-27562
- EDGERTON, GERRESHAUSEN AND GRIER, INC., IDAHO FALLS, IDAHO.  
Geothermal R and D project  
[TREE-1008] 15 p0393 N77-27538
- Guide for the conversion to and maintenance of hydrogen-fueled, spark-ignited engines  
[TREE-1036] 16 p0511 N77-28324
- Beneficial uses of geothermal energy description and preliminary results for phase 1 of the Raft River irrigation experiment  
[TREE-1048] 16 p0547 N77-32609
- EDGERTON, GERRESHAUSEN AND GRIER, INC., SALEM, MASS.  
Repetitive series Interrupter II  
[AD-A035267] 15 p0371 N77-25447

## EIC, INC., NEWTON, MASS.

Study of silica scaling from geothermal brines  
[PB-262890/7] 15 p0357 N77-23626

## ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.

The proceedings of the NOx Control Technology  
Seminar  
[PB-253661/3] 13 p0092 N77-10707

Nuclear unit productivity analysis  
[PB-257553/8] 13 p0132 N77-15528

Energy storage: User needs and technology  
applications  
[CONF-760212-SUMM] 14 p0222 N77-19604

Electric utility solar energy activities, 1976  
survey  
[EPRI-ER-321-SR] 16 p0515 N77-28598

Proceedings of the Workshop on Analysis of 1974  
and 1975 Power Growth  
[EPRI-ER-318-SR] 16 p0536 N77-31633

## ELECTRO-OPTICAL SYSTEMS, INC., PASADENA, CALIF.

Comparison of candidate solar array maximum  
power utilization approaches  
13 p0041 A77-12836

## ELECTROTECHNICAL LAB., TOKYO (JAPAN).

Feasibility of hydrogen production by direct  
water splitting at high temperature  
14 p0240 N77-21606

An investigation of hydrogen production from  
water at high temperatures  
14 p0240 N77-21607

## ENERGY AND ENVIRONMENTAL ANALYSIS, INC., ARLINGTON, VA.

Laws and regulations affecting coal with  
summaries of Federal, State, and local laws  
and regulations pertaining to air and water  
pollution control, reclamation, diligence and  
health and safety, part 1  
[PB-255927/6] 13 p0110 N77-12592

## ENERGY DEVELOPMENT ASSOCIATES, MADISON HEIGHTS, MICH.

Evaluation of a 1 kWh zinc chloride battery system  
[PB-260683/8] 14 p0236 N77-21356

## ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION,

## BARTLESVILLE, OKLA.

Heating oils, 1976  
[BERC/PES-76/4] 15 p0344 N77-22626

Fuel consumption, emissions, and power  
characteristics of the 1975 Ford 140-CID  
automotive engine, experimental data  
[PB-261771/0] 15 N77-22725

Experimental results using methanol and  
methanol/gasoline blends as automotive engine  
fuel  
[BERC/RI-76/15] 15 p0389 N77-27245

## ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION,

## GRAND FORKS, N. DAK.

Technology and use of low-rank coals in the USA  
[CONF-760495-1] 15 p0392 N77-27519

## ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION,

## LARABIE, WYO.

Environmental impact studies related to  
underground coal gasification  
[TID-27003] 13 p0100 N77-11573

## ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION, OAK

## RIDGE, TENN.

ERDA energy information data base: Magnetic  
tape description  
[TID-4581-R3] 13 p0102 N77-11695

Geothermal resources: Exploration and  
exploitation. A bibliography  
[TID-3354-R1] 14 p0249 N77-21676

## ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION,

## PITTSBURGH, PA.

Chemical characterization of diesel exhaust  
particulates  
[PERC/RI-77/5] 16 p0540 N77-31671

## ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION,

## WASHINGTON, D. C.

Potential structural material problems in a  
hydrogen energy system  
15 p0281 A77-33389

Thermal storage for electric utilities  
[ATAA 77-1009] 16 p0403 A77-41556

ERDA's Chemical Energy Storage Program  
16 p0450 A77-48763

Creating energy choices for the future. Public  
meeting on A National Plan for Energy  
Research, Development, and Demonstration  
[CONF-751228-P2] 13 p0087 N77-10646

National program for solar heating and cooling  
(residential and commercial applications)

[ERDA-23A] 13 p0098 N77-11540

Assessment of the role of magnetic mirror  
devices in fusion power development  
[ERDA-76-74] 14 p0213 N77-17872

Neutral beam energy and power requirements for  
the next generation of tokamaks  
[ERDA-76-77] 14 p0213 N77-17883

Utilization of solar energy  
[ERDA-TR-144] 14 p0216 N77-18572

National plan for energy research, development  
and demonstration: Creating energy choices for  
the future. Volume 2: Program implementation  
[ERDA-76-1-VOL-2] 14 p0222 N77-19600

Energy storage: User needs and technology  
applications  
[CONF-760212-SUMM] 14 p0222 N77-19604

Fossil energy research program of the Energy  
Research and Development Administration, FY 1977  
[ERDA-76-63] 14 p0222 N77-19611

ERDA solar heating and cooling demonstration  
program structure  
[ERDA-76-81] 14 p0230 N77-20573

Solar energy, DFVLR activities  
[ERDA-TR-143] 14 p0230 N77-20575

Hydrogen storage on highway vehicles: Update 1976  
14 p0242 N77-21614

ERDA's hydrogen programs  
14 p0246 N77-21650

Solar energy environmental and resource  
assessment program  
[ERDA-76-138] 15 p0344 N77-22621

Comparison of different wind energy conversion  
systems. Part 1: The NOAA system compared  
with the Ulrich BUTTER system  
[RFP-TRANS-204-PT-1] 15 p0346 N77-22637

National program for solar heating and cooling  
of buildings: Project data summaries. Volume  
1: Commercial and residential demonstration  
[ERDA-76-127] 15 p0346 N77-22639

Site energy handbook. Volume 2: Forms for  
energy survey and appraisal  
[ERDA-76-131/2] 15 p0355 N77-23608

An economic analysis of solar water and space  
heating  
[DSR/2322-1] 15 p0363 N77-24588

Energy and physics  
[ERDA-TR-225] 15 p0386 N77-26916

Energy sources for tomorrow  
[ERDA-TR-226] 15 p0391 N77-27507

Hydrogen-via-electricity: A candidate  
transitional transportation energy system  
concept  
[ERDA-77-13] 16 p0514 N77-28596

National program plan for research and  
development in solar heating and cooling  
[ERDA-76-144] 16 p0514 N77-28597

National program for solar heating and cooling  
of buildings  
[ERDA-76-6] 16 p0515 N77-28604

Creating energy choices for the western region  
[ERDA-76-1-PM-3] 16 p0515 N77-28605

Ocean Thermal Energy Conversion (OTEC)  
16 p0526 N77-30278

Management plan for enhanced oil recovery.  
Volume 1: Program strategy  
[ERDA-77-15/1-VOL-1] 16 p0536 N77-31629

Energy Technologies for the West: Geothermal;  
Energy from the earth  
[TID-27431] 16 p0537 N77-31642

Energy Technologies for the West: Can the  
Individual's Voice be Heard; Public  
Participation in Energy Planning  
[TID-27433] 16 p0537 N77-31643

Energy technologies for the West: The Fossil  
Option  
[TID-27430] 16 p0537 N77-31644

Energy technologies for the west: What impact  
could energy technology development have on  
the quality of life  
[TID-27428] 16 p0538 N77-31645

Energy technologies for the West: General  
Session, volume 2  
[TID-27427] 16 p0538 N77-31646

Energy technologies for the West: Fission as an  
option  
[TID-27432] 16 p0538 N77-31647



- Energy Technologies for the West: Economic Growth and Energy [TID-27429] 16 p0538 N77-31648
- National energy projections and plans of the USA [IAEA-CN-36/397] 16 p0548 N77-32619
- Role of fusion as a future power source [IAEA-CN-36/428] 16 p0549 N77-32895
- Public acceptance of nuclear power [IAEA-CN-36/507] 16 p0555 N77-33630
- Program plan for ERDA's participation in the IEA working party on energy conservation research and development [ERDA-77-57] 16 p0557 N77-33648
- ENERGY RESEARCH CORP., DANBURY, CONN.  
Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 15 p0278 A77-33363
- Fuel cell stacks [AD-A024216] 13 p0090 N77-10684
- Fuel cell stacks [AD-A030375] 14 p0213 N77-17603
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries 14 p0239 N77-21597
- New materials for fluorosulfonic acid electrolyte fuel cells [AD-A036988] 15 p0380 N77-26640
- Fuel cell stacks [AD-A037586] 15 p0380 N77-26641
- Fabrication and testing of large size nickel-zinc cells [NASA-CR-135200] 16 p0529 N77-30610
- ENERGY RESOURCES CO., INC., CAMBRIDGE, MASS.  
Environmental research needs for coal conversion and combustion technologies [PB-262159/7] 15 p0347 N77-22659
- ENERGY RESOURCES COUNCIL, WASHINGTON, D. C.  
Perspective on energy policy [PB-261736/3] 15 p0348 N77-22674
- ENGELHARD MINERALS AND CHEMICALS CORP., EDISON, N. J.  
Durability testing at one atmosphere of advanced catalysts and catalyst supports for automotive gas turbine engine combustors, part 1 [NASA-CR-135132] 16 p0520 N77-29519
- ENGELHARD MINERALS AND CHEMICALS CORP., UNION, N. J.  
EPA Van operational manual [PB-259177/4] 14 p0233 N77-20608
- ENVIRONMENTAL HEALTH LAB., MCCLELLAN AFB, CALIF.  
A bioenvironmental study of emissions from refuse derived fuel [AD-A024661] 13 p0110 N77-12571
- ENVIRONMENTAL MONITORING AND SUPPORT LAB., LAS VEGAS, NEV.  
First Workshop on Sampling Geothermal Effluents [PB-258067/8] 14 p0207 N77-16433
- ENVIRONMENTAL MONITORING AND SUPPORT LAB., RESEARCH TRIANGLE PARK, N. C.  
Determination of hydrogen sulfide in refinery fuel gases [PB-268240/9] 16 p0543 N77-32277
- ENVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MICH.  
Automobile emission control. The development status, trends, and outlook as of December 1976 [PB-267865/4] 16 p0540 N77-31685
- Automobile emission control: Technological approaches toward improving in-use vehicle emissions performance [PB-267537/9] 16 p0544 N77-32508
- ENVIRONMENTAL PROTECTION AGENCY, DENVER, COLO.  
Existing and proposed fuel conversion facilities. Summary [PB-258264/1] 14 p0208 N77-16457
- ENVIRONMENTAL PROTECTION AGENCY, PHILADELPHIA, PA.  
Characterization and evaluation of wastewater sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976 [PB-255586/0] 13 p0116 N77-13566
- ENVIRONMENTAL PROTECTION AGENCY, RESEARCH TRIANGLE PARK, N. C.  
National Emissions Data Systems (NEDS) fuel use report, 1973 [PB-253908/8] 13 p0083 N77-10220
- Compilation of air pollutant emission factors. Supplement [PB-254274/4] 13 p0093 N77-10731
- Standards support and environmental impact statement. Volume 1: Proposed standards of performance for petroleum refinery sulfur recovery plants [PB-257975/3] 14 p0213 N77-17647
- ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D. C.  
Report of the Hearing Panel: National Public hearing on Power Plant Compliance with Sulfur Oxide Air Pollution Regulations [PB-264891/3] 15 p0396 N77-27625
- Western energy/environment monitoring study: Planning and coordination summary [PB-266256/7] 16 p0523 N77-29632
- Photovoltaic conversion program [ERDA-76-161] 16 p0538 N77-31653
- ENVIRONMENTAL RESEARCH INST. OF MICHIGAN, ANN ARBOR.  
Thermographic mosaic of Yellowstone National Park p0001 A77-10121
- ENVIRONMENTAL TECHNOLOGY ASSESSMENT, INC., OAK BROOK, ILL.  
The air quality and economic implications of supplementary control systems in Illinois [PB-255699/1] 13 p0101 N77-11588
- EQUITABLE ENVIRONMENTAL HEALTH, INC., WOODBURY, N. Y.  
Selected aspects of waste heat management: A state-of-the-art study [PB-255697/5] 13 p0100 N77-11563
- Selected aspects of waste heat management [PB-254401/3] 13 p0109 N77-12568
- ERNST AND ERNST, WASHINGTON, D. C.  
Energy-economy relationships [PB-255171/1] 13 p0099 N77-11552
- Review of energy forecasting methodologies and assumptions [PB-255170/3] 13 p0107 N77-12546
- ESB, INC., YARDLEY, PA.  
Sodium chloride battery development program for load leveling [PB-257570/2] 14 p0208 N77-16456
- ESSO RESEARCH CENTER, ABINGDON (ENGLAND).  
Chemically active fluid-bed process for sulphur removal during gasification of heavy fuel oil, phase 3 [PB-268492/6] 16 p0548 N77-32615
- EUROPEAN SPACE AGENCY, PARIS (FRANCE).  
Heat pipes, volume 2 [ESA-SP-112-VOL-2] 13 p0119 N77-14378
- Production of chemical energy carriers by non-expandable energy sources [ESA-TT-338] 14 p0251 N77-21701
- The cylindrical parabolic mirror as reflector for solar collectors-efficiencies and optimization [ESA-TT-365] 15 p0365 N77-24615
- EXXON ENTERPRISES, INC., NEW YORK.  
Application of the Alstom/Exxon alkaline fuel cell system to utility power generation [EPRI-EN-384] 16 p0557 N77-33643
- EXXON RESEARCH AND ENGINEERING CO., LINDEN, N. J.  
Photochemical conversion of solar energy [PB-255703/1] 13 p0090 N77-10685
- Investigation and assessment of light-duty-vehicle evaporative emission sources and control [PB-255813/8] 13 p0102 N77-11603
- Carbon oxidation catalyst mechanism study for fuel cells [PB-256420/1] 13 p0115 N77-13551
- Evaluation of pollution control in fossil fuel conversion processes [PB-255842/7] 13 p0125 N77-14638
- Evaluation of methods to produce aviation turbine fuels from synthetic crude oils, phase 2, volume 2 [AD-A036190] 16 p0511 N77-28325
- Development of high stability fuel. Executive summary [AD-A039977] 16 p0533 N77-31339
- Redox bulk energy storage system study, volume 1 [NASA-CR-135206-VOL-1] 16 p0553 N77-33608
- Redox bulk energy storage system study, volume 2 [NASA-CR-135206-VOL-2] 16 p0553 N77-33609

## F

- FAIRCHILD SPACE AND ELECTRONICS CO., GERMANTOWN, MD.  
The ITS-6 power system - Hardware implementation and orbital performance 13 p0040 A77-12831

- Nuclear-powered Hysat spacecraft: Comparative design study  
[ERDA-SNS-3063-8] 13 p0094 N77-11108
- FAUCETT (JACK) ASSOCIATES, INC., CHEVY CHASE, MD.  
Macro-economic impact and other considerations in selecting energy conservation measures  
[PB-257678/3] 14 p0208 N77-16454
- Truck fleet experience with fuel economy improvement measures  
[PB-263022/6] 15 p0361 N77-24514
- FEDERAL AVIATION ADMINISTRATION, WASHINGTON, D. C.  
Report to congress by the Federal Aviation Administration on the energy efficiency of agency regulations  
[AD-A034611] 15 p0359 N77-24103
- FEDERAL ENERGY ADMINISTRATION, WASHINGTON, D. C.  
National petroleum product supply and demand, 1976 - 1978  
[PB-254969/9] 13 p0084 N77-10224
- Directory of Federal energy data sources:  
Computer products and recurring publications  
[PB-254163/9] 13 p0093 N77-10941
- Mandatory Canadian crude oil allocation regulations  
[PB-255319/6] 13 p0096 N77-11509
- Strategic petroleum reserve  
[PB-255476/4] 13 p0098 N77-11546
- Energy information activities at the FEA  
[PB-253962/5] 13 p0099 N77-11553
- A survey of salt deposits and salt caverns: Their relevance to the strategic petroleum reserve  
[PB-255548/2] 13 p0105 N77-12500
- Crude oil supply alternatives for the Northern Tier states  
[PB-255991/2] 13 p0107 N77-12530
- Petroleum market shares. Report on sales of propane to ultimate consumers, 1975  
[PB-255624/9] 13 p0108 N77-12540
- Implementing coal utilization provisions of Energy Supply and Environmental Coordination Act  
[PB-255855/9] 13 p0109 N77-12549
- Economics of depletable resources: Market forces and intertemporal bias  
[PB-255623/1] 13 p0111 N77-12930
- Final assessment of the environmental impacts of the State Energy Conservation Program (Public law 94-163, Title III, part C, The Energy Policy and Conservation Act)  
[PB-256044/9] 13 p0116 N77-13555
- Weekly petroleum statistics reports, 1974-1975  
[PB-255920/1] 13 p0124 N77-14608
- The exploration, development, and production of Naval Petroleum Reserve Number 4  
[PB-255947/4] 13 p0124 N77-14610
- Trends in refinery capacity and utilization: Petroleum refineries in the United States; foreign refinery exporting centers  
[PB-256966/3] 13 p0132 N77-15523
- Rapid growth from energy projects: Ideas for state and local action. A program guide  
[PB-257374/9] 13 p0132 N77-15527
- Report to Congress on the economic impact of energy actions  
[PB-256684/2] 14 p0208 N77-16450
- Solar collector manufacturing activity, January-June 1976  
[PB-258865/5] 14 p0208 N77-16455
- Summary report of three powerplant productivity studies  
[PB-257764/1] 14 p0212 N77-17598
- Proposed energy conservation contingency plan: Emergency heating, cooling and hot water restrictions. Economic impact analysis. Environmental impact assessment  
[PB-258624/6] 14 p0217 N77-18584
- Report to Congress on the economic impact of energy actions  
[PB-257697/3] 14 p0218 N77-18596
- Projected natural gas curtailments and potential needs for additional alternate fuels, 1976-1977 heating season  
[PB-260535/0] 14 p0235 N77-21257
- Petroleum market shares: A report on sales of distillate and residual fuel oil to ultimate consumers, 1975  
[PB-260565/7] 15 p0341 N77-22292
- Strategic petroleum reserve. Final environmental impact statement for Bayou Choctaw Salt Dome  
[PB-261984/9] 15 p0341 N77-22294
- Strategic petroleum reserve plan (Public Law 94-163, section 154)  
[PB-261737/1] 15 p0342 N77-22591
- Report of the Presidential task force on reform of Federal Energy Administration regulations, volume 1  
[PB-262181/1] 15 p0347 N77-22649
- Report of the Presidential task force on reform of Federal Energy Administration regulations, volume 2. Table of contents. Appendixes  
[PB-262182/9] 15 p0347 N77-22650
- Strategic petroleum reserve. Final environmental impact statement, volume 1  
[PB-261799/1] 15 p0349 N77-22675
- Strategic petroleum reserve. Final environmental impact statement, volume 2  
[PB-261800/7] 15 p0349 N77-22676
- Electric utility finance workshop  
[PB-261661/3] 15 p0349 N77-22677
- Petroleum market shares - A report on sales of refined petroleum products, 1972 through 1975: Aviation gasoline, jet fuels, middle distillate fuel oils, residual fuel oil, motor gasoline  
[PB-262726/3] 15 p0360 N77-24321
- Strategic petroleum reserve draft environmental impact statement for Central Rock Mine  
[PB-262390/8] 15 p0362 N77-24572
- Strategic petroleum reserve. Draft environmental impact statement for Ironstone Mine  
[PB-262451/8] 15 p0362 N77-24573
- Strategic petroleum reserve. Bryan Mount salt dome  
[PB-262839/4] 15 p0362 N77-24579
- Strategic petroleum reserve. West Hackberry salt dome  
[PB-262508/5] 15 p0362 N77-24580
- Second quarterly report to US House and Senate Committees on Appropriations  
[PB-263418/6] 15 p0365 N77-24616
- Trends in power plant capacity and utilization. Inventory of power plants in the United States  
[PB-264451/6] 15 p0373 N77-25655
- Federal energy information gathering activities: A report to the President of the United States, and the Energy Resources Council  
[PB-262844/4] 15 p0374 N77-25668
- Coal conversion program. Energy Supply and Environmental Coordination Act (as amended). Section 2  
[PB-265815/1] 15 p0393 N77-27542
- Mid-term and long term energy trends  
[PB-264740/2] 15 p0395 N77-27559
- Petroleum situation reports 1974-1975  
[PB-265848/2] 16 p0513 N77-28573
- FEA energy financing workshops. Section 1: Summaries of proceedings. Section 2: Background papers  
[PB-265706/2] 16 p0517 N77-28615
- Quarterly report to US House and Senate Committees on Appropriations (3rd)  
[PB-265890/3] 16 p0517 N77-28616
- Project Independence Evaluation System (PIES) documentation. Volume 2: PIES econometric demand model  
[PB-265822/7] 16 p0519 N77-29327
- Strategic petroleum reserve. Supplement final environmental impact statement. West Hackberry salt dome  
[PB-265796/3] 16 p0520 N77-29597
- Project Independence Evaluation System (PIES) documentation. Volume 15: Standard data tables for PIES  
[PB-265195/8] 16 p0523 N77-29629
- Energy situation  
[PB-266836/6] 16 p0530 N77-30633
- Continuation of the adjustment as a production incentive to the maximum weighted average first sale price for domestic crude oil (Energy Action no. 11)  
[PB-266841/6] 16 p0530 N77-30636
- Solar collector manufacturing activity  
[PB-266985/1] 16 p0558 N77-33664

FEDERAL HIGHWAY ADMINISTRATION, WASHINGTON, D.C.  
Federal energy information locator system:  
Energy information in the federal government  
[PB-262331/2] 16 p0539 N77-31661

FEDERAL POWER COMMISSION, WASHINGTON, D. C.  
Preliminary investigation. Nonproducing gas  
reserves onshore United States and in the Gulf  
of Mexico offshore state area, as reported in  
Federal Commission form 15  
[PB-263434/3] 15 p0355 N77-23597

The phasing out of natural gas and oil for  
electric power generation, southwest power  
pool and Electric Reliability Council of  
Texas. Part 2: Technical and economic  
evaluation of various possible electric  
utility natural gas reduction programs, 1975 -  
1990  
[PB-263565/0] 15 p0356 N77-23617

State projections of industrial fuel needs  
[PB-263338/6] 15 p0356 N77-23620

The future of natural gas: Economic myths,  
regulatory realities  
[PB-263625/6] 15 p0356 N77-23621

Incremental pricing of supplemental gas  
[PB-263689/2] 15 p0360 N77-24319

The gas supplies of interstate natural gas  
pipeline companies, 1975  
[PB-263558/5] 15 p0360 N77-24320

Factors affecting the electric power supply,  
1980-85: Executive summary and recommendations  
[PB-264760/0] 15 p0395 N77-27560

National gas flow patterns 1975: Geographic  
flow patterns and intercompany relationships  
[PB-266111/4] 16 p0512 N77-28328

National gas survey. Report to the federal  
power commission by the Supply-Technical  
Advisory Task force on the regulatory aspects  
of substitute gas  
[PB-265877/1] 16 p0519 N77-29323

National gas survey. Report to the federal  
power commission by the Supply-Technical  
Advisory Committee Study Subgroup on reserves  
and resources classifications  
[PB-265878/9] 16 p0519 N77-29324

Summary of cost and quality of electric utility  
plant fuels, 1976  
[PB-267368/9] 16 p0543 N77-32335

FEDERAL RAILROAD ADMINISTRATION, WASHINGTON, D. C.  
Fuel efficiency improvement in rail freight  
transportation: Multiple unit throttle  
control to conserve fuel  
[PB-262470/8] 15 p0366 N77-24629

FLINDERS UNIV., BEDFORD PARK (AUSTRALIA).  
The theory of hydrogen production in a  
photoelectrochemical cell  
14 p0239 N77-21604

FLORIDA INTERNATIONAL UNIV., MIAMI.  
Energy and the future  
14 p0246 N77-21657

FLORIDA UNIV., GAINESVILLE.  
Fundamental electronic mechanisms limiting the  
performance of solar cells  
15 p0257 A77-30710

Basic mechanisms governing solar-cell efficiency  
16 p0486 A77-49060

Studies of silicon p-n junction solar cells  
[NASA-CR-149669] 14 p0215 N77-18557

Safety flywheel  
[NASA-CASE-HQN-10888-1] 15 p0342 N77-22484

Two-phase Hartmann flows in the MHD generator  
configuration  
[AD-A036452] 16 p0518 N77-28948

FLUOR ENGINEERS AND CONSTRUCTORS, INC., LOS  
ANGELES, CALIF.  
Economics of a freeze desalting process using  
cold seawater effluent of a liquid natural gas  
plant  
[PB-259272/3] 14 p0234 N77-20656

FOSTER WHEELER CORP., LIVINGSTON, N.J.  
Development work for an advanced coal  
gasification system for electric power  
generation from coal directed toward a  
commercial gasification generating plant,  
phase 2  
[FE-1521-13] 13 p0130 N77-15501

FRANKLIN INST. RESEARCH LABS., PHILADELPHIA, PA.  
Technical and economic feasibility of solar  
augmentation for boiler feedwater heating in  
steam-electric power plants  
[COO-2864-1] 16 p0555 N77-33626

FUSION SYSTEMS CORP., ROCKVILLE, MD.  
Enhanced energy utilization from a controlled  
thermonuclear fusion reactor  
[PB-260653/1] 14 p0234 N77-20879

## G

GEC-MARCONI ELECTRONICS LTD., CHELMSFORD (ENGLAND).  
Heat pipe and space radiator developments  
13 p0120 N77-14391

GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C.  
Energy policy decisionmaking, organization, and  
national energy goals  
[PB-269299/4] 16 p0559 N77-33671

GENERAL ATOMIC CO., SAN DIEGO, CALIF.  
Hydrogen production from coal using a nuclear  
heat source  
15 p0275 A77-33339

Characteristics of a first generation commercial  
fusion power plant  
[GA-A-13661] 13 p0093 N77-10891

Hydrogen production from coal using a nuclear  
heat source  
14 p0238 N77-21568

Design considerations for a noncircular Tokamak  
demonstration plant  
[GA-A-14074] 15 p0351 N77-22968

Gas turbine HTGE program  
[GA-A-14097] 15 p0393 N77-27539

GENERAL ELECTRIC CO., CINCINNATI, OHIO.  
Study of unconventional aircraft engines  
designed for low energy consumption  
[NASA-CR-135136] 13 p0127 N77-15043

Variable cycle engine applications and constraints  
15 p0339 N77-22125

Oil cooling system for a gas turbine engine  
[NASA-CASE-LEW-12830-1] 15 p0353 N77-23106

GENERAL ELECTRIC CO., PHILADELPHIA, PA.  
System studies of coal fired-closed cycle MHD  
for central station power plants  
13 p0034 A77-12786

System studies of coal fired-closed cycle MHD  
for central station power plants  
14 p0142 A77-21267

Two component thermal energy storage material  
[PB-252592/1] 13 p0090 N77-10675

Definition study for photovoltaic residential  
prototype system  
[NASA-CR-135039] 13 p0113 N77-13532

General Electric Company study for defining the  
number of residential and non-residential  
projects, National Solar Demonstration Program  
[COO-2683-76-7] 14 p0217 N77-18579

Technical and economic feasibility of thermal  
energy storage  
[COO-2558-1] 14 p0222 N77-19605

General Electric Company proposed management  
plan, commercial buildings, National Solar  
Demonstration Program  
[COO-2683-76-3] 14 p0229 N77-20568

General Electric Company proposed demonstration  
Projects Matrix, commercial buildings,  
National Solar Demonstration Program  
[COO-2683-76-5] 14 p0230 N77-20569

Proposed management plan, commercial buildings  
[COO-2683-76-8] 14 p0230 N77-20570

Proposed test and evaluation plan, commercial  
buildings  
[COO-2683-76-9] 14 p0230 N77-20571

Proposed demonstration Projects Matrix,  
commercial buildings  
[COO-2683-76-10] 14 p0230 N77-20572

Technology evaluation report, commercial buildings  
[COO-2683-76-1] 14 p0232 N77-20603

MHD generator investigations  
[AD-A032790] 15 p0358 N77-23952

General Electric Company survey to define impact  
of statewide building codes on solar HVAC  
systems, commercial buildings. National Solar  
Demonstration Program  
[COO-2683-76-11] 15 p0383 N77-26674

Wind energy: A renewable energy option  
16 p0525 N77-30276

## GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.

Role of the heat storage well future U.S. energy systems  
[PB-263480/6] 15 p0367 N77-24634

## GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

Future trends in electrical energy generation economics in the United States  
15 p0317 A77-37960

Conceptual design of closed Brayton cycle for coal-fired power generation  
16 p0445 A77-48714

High temperature gas turbine engine  
[FE-1765-8] 13 p0120 N77-14488

Economic and technical feasibility study of compressed air storage  
[COO-2559-1] 13 p0122 N77-14593

High temperature gas turbine engine component materials testing program  
[FE-1765-7] 13 p0127 N77-15401

Energy Conversion Alternatives Study (ECAS), phase 2. Volume 1: Executive summary  
[NASA-CR-134949-VOL-1] 15 p0379 N77-26631

Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems, - conceptual designs.  
Part 1: Analytical approach  
[NASA-CR-134949-VOL-2-PT-1] 15 p0379 N77-26632

Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 2: Closed turbine cycles  
[NASA-CR-134949-VOL-2-PT-2] 15 p0379 N77-26633

Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems - conceptual designs. Part 3: Open cycle gas turbines and open cycle MHD  
[NASA-CR-134949-VOL-2-PT-3] 15 p0379 N77-26634

Energy Conversion Alternatives Study (ECAS), phase 2. Volume 2: Advanced energy conversion systems: Conceptual designs. Part 4: Summary of results  
[NASA-CR-134949-VOL-2-PT-4] 15 p0380 N77-26635

Energy Conversion Alternatives Study (ECAS), phase 2. Volume 3: Research and development plans and implementation assessment  
[NASA-CR-134949-VOL-3] 15 p0380 N77-26636

Development of sodium-sulfur batteries for utility application  
[EPRI-EM-266] 15 p0391 N77-27510

Demonstration of an inductor motor/alternator/flywheel energy storage system  
[COO-4010-1] 16 p0535 N77-31620

Research into the impact on electrical equipment from variable speed operation of pumped-storage plants  
[PB-268323/3] 16 p0548 N77-32618

## GENERAL ELECTRIC CO., WASHINGTON, D. C.

Energy input-output modelling: Problems and prospects  
[PB-261925/2] 15 p0349 N77-22679

## GENERAL ELECTRIC CO., WILMINGTON, MASS.

Development of fuel cell CO detection instruments for use in a mine atmosphere  
[PB-254823/8] 13 p0095 N77-11380

Solid polymer electrolyte (SPE) fuel cell technology, program review, phase 2  
[NASA-CR-150957] 13 p0097 N77-11532

Solid polymer electrolyte (SPE) fuel cell technology program, phase 1/1A  
[NASA-CR-151506] 16 p0553 N77-33605

Solid polymer electrolyte (SPE) fuel cell technology program, phase 2/2A  
[NASA-CR-151507] 16 p0553 N77-33606

## GEOLOGICAL SURVEY, DENVER, COLO.

Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121

## GEOLOGICAL SURVEY, RESTON, VA.

Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121

## GEOLOGICAL SURVEY, WASHINGTON, D. C.

Mineral resources: Potentials and problems  
[USGS-CIRC-698] 16 p0544 N77-32563

## GEONOMICS, INC., BERKELEY, CALIF.

Geotechnical environmental aspects of geothermal power generation Heber, Imperial Valley, California  
[PB-260848/7] 15 p0349 N77-22680

## GEORGE WASHINGTON UNIV., WASHINGTON, D. C.

Underground coal mining: An assessment of technology  
[PB-255726/2] 13 p0093 N77-10974

Trends in world oil prices and production  
[PB-268411/6] 16 p0547 N77-32607

## GEORGIA INST. OF TECH., ATLANTA.

Clean fuels from agricultural and forestry wastes  
[PB-259956/1] 14 p0233 N77-20610

## GEOTHERMAL RESOURCES COUNCIL, DAVIS, CALIF.

Proceedings of 2nd Workshop on Materials Problems Associated with the Development of Geothermal Energy Systems  
[PB-261349/5] 14 p0252 N77-21725

## GESELLSCHAFT FUER KERNFORSCHUNG M.B.H., KARLSRUHE (WEST GERMANY).

Hydrogen production by means of reactor heat using halogens and reversible electrochemical methods in a closed cycle process  
14 p0238 N77-21582

## GILBERT ASSOCIATES, INC., READING, PA.

Design phase utility analysis for gas turbine and combined cycle plants  
[PB-256665/1] 13 p0115 N77-13553

Participating surveillance services for electric power program. Coal conversion and utilization: Direct combustion of coal-90e, advanced power-90f. Summary for ERDA annual report, CY 1975  
[FE-1236-4] 13 p0130 N77-15507

## GINER, INC., WALTHAM, MASS.

Study of corrosion and its control in aluminum solar collectors  
[COO-2934-76-1] 15 p0383 N77-26673

## GORDIAN ASSOCIATES, INC., NEW YORK.

Evaluation of the air-to-air heat pump for residential space conditioning  
[PB-255652/0] 13 p0108 N77-12545

Structural reform in the electric power industry  
[PB-264589/3] 15 p0389 N77-27316

## GRINES (W. J.) AND CO., HINGHAM, MASS.

Preliminary report on simulation of a heliostat field  
[ERDA-TR-158] 14 p0226 N77-19782

## GRUHNAN AEROSPACE CORP., BETHPAGE, N.Y.

Space solar power - An available energy source  
13 p0056 A77-15946

Re-entrant groove heat pipe  
[AIAA PAPER 77-773] 15 p0312 A77-37280

Molten salt thermal energy storage for utility peaking loads  
16 p0451 A77-48765

Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis of orbital systems  
[NASA-CR-150147] 13 p0129 N77-15495

Solar assisted heat pump demonstration project, phase 1  
[PB-259289/7] 14 p0217 N77-18589

Diffuser augmentation of wind turbines  
[CONF-760842-6] 16 p0521 N77-29610

A non-aerospace application of plans: Preliminary structural design of wind turbine diffuser  
[RH-629] 16 p0534 N77-31604

## GULTON INDUSTRIES, INC., HIGH POINT, N. C.

Design modification of Pemco Model 702909 wireless ground monitor  
[PB-262858/4] 15 p0360 N77-24371

## H

## HAMILTON STANDARD, WINDSOR LOCKS, CONN.

Experimental and analytical research on the aerodynamics of wind turbines  
[COO-2615-76-T-1] 14 p0223 N77-19613

Multi-mission uses for prop-fan propulsion  
15 p0339 N77-22127

## HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.

Economic analysis of the need for advanced power sources  
[HEDL-SA-989] 13 p0131 N77-15509

## HARRISBURG HOUSE, INC., BOSTON, MASS.

Cost analysis of two air quality attainment strategies  
[PB-254182/9] 13 p0092 N77-10719

- HARRY DIAMOND LABS., ADELPHI, MD.**  
Research and development assessment on safety and pollution control for outer continental shelf operations  
[AD-A034727] 15 p0357 N77-23635
- HARVARD COLL. OBSERVATORY, CAMBRIDGE, MASS.**  
Measurements of Sc I gf-values 13 p0058 A77-16270
- HARVARD UNIV., CAMBRIDGE, MASS.**  
US options for a transition from oil and gas to synthetic fuels 14 p0247 N77-21661
- HARZA ENGINEERING CO., CHICAGO, ILL.**  
Comprehensive ground control study of a mechanized longwall operation. Volume 2: Special reports. 1: Physical properties of coal and coal measure rocks. 2: Bearing capacity of roof and floor rocks. 3: Response of borehole pressure cells. 4: Installation of subsurface instrumentation [PB-262476/5] 15 p0368 N77-24711
- HAWAII INST. OF GEOPHYSICS, HONOLULU.**  
A coordinated exploration program for geothermal sources on the island of Hawaii [PB-261691/0] 15 p0350 N77-22685
- HAWAII UNIV., HONOLULU.**  
Synchronization of the ERDA-NASA 100 kW wind turbine generator with large utility networks 15 p0267 A77-32243
- Numerical solutions for transient heating and withdrawal of fluid in a liquid-dominated geothermal reservoir [PB-261562/3] 14 p0252 N77-21726
- Similarity solutions for mixed convection from horizontal impermeable surfaces in saturated porous media [PB-261561/5] 15 p0342 N77-22432
- The influence of lateral mass efflux on free convection boundary layers in a saturated porous medium [PB-261558/1] 15 p0342 N77-22587
- Legal and public policy setting for geothermal resource development in Hawaii [PB-262910/3] 15 p0343 N77-22596
- Conceptual design of a 10MW regenerative isobutane geothermal power plant [PB-261563/1] 15 p0349 N77-22683
- Working fluid selection and preliminary heat exchanger design for a Rankine cycle geothermal power plant [PB-261564/9] 15 p0349 N77-22684
- The Hawaii geothermal project, initial phase 2 progress report [PB-263120/8] 15 p0355 N77-23594
- Regenerative vapor cycle with isobutane as working fluid [PB-262704/0] 15 p0356 N77-23622
- HEWLETT-PACKARD CO., LOVELAND, COLO.**  
Efficiency calculations for Al<sub>x</sub>/Ga<sub>1-x</sub>/As-GaAs heteroface solar cells 15 p0257 A77-30720
- HITMAN ASSOCIATES, INC., COLUMBIA, MD.**  
Underground coal mining: An assessment of technology [PB-255726/2] 13 p0093 N77-10974
- Comparative evaluation of solar heating alternatives [COO-2703-2] 13 p0129 N77-15498
- Coefficient of performance for solar-powered space cooling systems [CONF-760618-1] 14 p0220 N77-19585
- Energy utilization index method for predicting building energy use. Volume 2: Proposed supplement to TB ENG 529 [AD-A040344] 16 p0521 N77-29608
- HOLT/PROCON, PASADENA, CALIF.**  
Energy conversion and economics for geothermal power generation at Heber, California, Valles Caldera, New Mexico, and Salt River, Idaho: Case studies [PB-261845/2] 14 p0251 N77-21712
- HONEYWELL CORPORATE RESEARCH CENTER, BLOOMINGTON, MINN.**  
Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project [NASA-CR-149242] 13 p0105 N77-12513
- HONEYWELL, INC., MINNEAPOLIS, MINN.**  
Improved black nickel coatings for flat plate solar collectors 14 p0204 A77-29585
- Conceptual design of a parabolic dish solar collector using simulation techniques 15 p0318 A77-38211
- Low-profile heliostat design for solar central receiver systems 16 p0422 A77-44480
- Technical feasibility of a modular dish solar electric system 16 p0483 A77-49034
- Design, fabrication, testing, and delivery of a solar energy collector system for residential heating and cooling [NASA-CR-150032] 13 p0086 N77-10638
- Solar pilot plant, phase 1 [SAN/1109-76/T1] 14 p0216 N77-18571
- Survey of the applications of solar thermal energy systems to industrial process heat. Volume 3: Solar thermal energy systems analysis and preliminary assessment of related nontechnical issues [TID-27348-VOL-3] 16 p0537 N77-31638
- Survey of the applications of solar thermal energy systems to industrial process heat. Volume 2: Industrial process heat survey [TID-27348-VOL-2] 16 p0537 N77-31639
- HONEYWELL, INC., ST. PAUL, MINN.**  
North View Junior High School solar energy demonstration project [PB-267447/1] 16 p0548 N77-32612
- HOUSTON UNIV., TEX.**  
The evaluation of surface geometry modification to improve the directional selectivity of solar energy collectors [PB-258848/1] 14 p0233 N77-20618
- Solar power satellite: Analysis of alternatives for transporting material to geosynchronous orbit [NASA-TN-X-74680] 14 p0235 N77-21136
- Solar tower characteristics 14 p0237 N77-21562
- Two-phase flow in geothermal energy sources [TID-27129] 14 p0250 N77-21689
- An economic model of new crude oil and natural gas supplies in the lower 48 states 16 p0552 N77-33596
- HUDSON INST., INC., CROTON-ON-HUDSON, N. Y.**  
Domestic and world trends (1980 - 2000) affecting the future of aviation [NASA-CR-144838] 13 p0126 N77-14981
- HUMAN RESOURCES PLANNING INST., SEATTLE, WASH.**  
A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 1 [PB-264705/5] 15 p0383 N77-26677
- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2 [PB-264706/3] 15 p0385 N77-26693
- IBM WATSON RESEARCH CENTER, YORKTOWN HEIGHTS, N.Y.**  
An isothermal etchback-regrowth method for high-efficiency Ga<sub>1-x</sub>Al<sub>x</sub>/As-GaAs solar cells 15 p0257 A77-30372
- ICF, INC., WASHINGTON, D. C.**  
Summary of EPA energy policy analysis [PB-253361/0] 13 p0089 N77-10669
- Gasoline and distillate shortage situation: 1972-1976 [PB-253322/2] 13 p0089 N77-10670
- Production and consumption of coal, 1976 - 1980 [PB-257441/6] 14 p0212 N77-17593
- Electric utility coal consumption and generation trends, 1976-1985 [PB-262483/1] 15 p0374 N77-25667
- Project Independence Evaluation System (PIES) documentation. Volume 6: Methodology for improving the price sensitivity of the PIES oil and gas supply curves [PB-264069/6] 16 p0516 N77-28606

- Project Independence Evaluation System (PIES) documentation. Volume 7: Methodology for developing more complex investment and production profiles in the FEA oil and gas supply model  
[PB-264649/5] 16 p0516 N77-28607
- Project Independence Evaluation System (PIES) documentation. Volume 9: Allocation of exploratory activity to oil and natural gas in the FEA oil and gas supply model  
[PB-265772/4] 16 p0519 N77-29325
- Project Independence Evaluation System (PIES) documentation. Volume 13: Coal and electric utility conventions for FIES  
[PB-265824/3] 16 p0519 N77-29326
- Project Independence Evaluation System (PIES) documentation. Volume 8: Methodology for enabling the PIES oil and gas supply curves to respond to non-constant prices  
[PB-265086/9] 16 p0523 N77-29630
- IDAHO NATIONAL ENGINEERING LAB., IDAHO FALLS.  
Geothermal R and D project report, 1 January - 31 March 1976  
[ANCR-1319] 14 p0222 N77-19607
- Plan for developing moderate temperature/low salinity geothermal resources  
[ANCR-1318] 14 p0223 N77-19614
- Modification techniques and performance characteristics of hydrogen-powered IC engines: State of the art, 1975  
14 p0244 N77-21634
- IDAHO UNIV., MOSCOW.  
Pumped storage potential of the Hell's Canyon area  
[PB-267722/7] 16 p0539 N77-31664
- Unconventional energy sources  
[PB-268301/9] 16 p0548 N77-32617
- IIT RESEARCH INST., CHICAGO, ILL.  
Weatherability of solar energy utilization materials: Preliminary discussions  
[CONF-760821-11] 14 p0225 N77-19650
- ILLINOIS STATE DEPT. OF BUSINESS AND ECONOMIC DEVELOPMENT, SPRINGFIELD.  
Energy recovery from solid waste: A review of current technology  
[PB-260633/3] 14 p0253 N77-22016
- ILLINOIS UNIV., URBANA.  
Fundamental electronic mechanisms limiting the performance of solar cells  
15 p0257 A77-30710
- Basic mechanisms governing solar-cell efficiency  
16 p0486 A77-49060
- Energy analysis handbook. CAC document 214  
[COO-2865-1] 15 p0372 N77-25635
- Energy use for building construction  
[COO-2791-2] 15 p0391 N77-27509
- ILLINOIS UNIV., URBANA-CHAMPAIGN.  
Isotopic characterization of Illinois natural gas  
13 p0113 N77-13484
- Mathematical models for use in planning regional water resources and energy systems  
[PB-261364/4] 15 p0352 N77-23022
- Techniques for the analysis of total energy and labor of industrial plants  
[PB-264221/3] 15 p0385 N77-26697
- IMPERIAL COLL. OF SCIENCE AND TECHNOLOGY, LONDON (ENGLAND).  
Modelling the atmospheric dispersal of radioactive pollutants beyond the first few hours of travel  
15 p0395 N77-27603
- INDIAN INST. OF TECH., MADRAS.  
Transfer function analysis of heat pipes  
13 p0119 N77-14385
- INDIANA UNIV., BLOOMINGTON.  
Pace and grade related to the oxygen and energy requirements, and the mechanics of treadmill running  
15 p0396 N77-27689
- INDUSTRIAL ENVIRONMENTAL RESEARCH LAB., RESEARCH TRIANGLE PARK, N. C.  
Proceedings: Symposium on Flue Gas Desulfurization, volume 1  
[PB-255317/0] 13 p0110 N77-12597
- Proceedings of the Stationary Source Combustion Symposium. Volume 1. Fundamental research  
[PB-256320/3] 13 p0116 N77-13569
- Proceedings of the Stationary Source Combustion Symposium. Volume 2. Fuels and process research and development  
[PB-256321/1] 13 p0116 N77-13570
- Proceedings of the Stationary Source Combustion Symposium. Volume 3: Field Testing and Surveys  
[PB-257146/1] 13 p0145 N77-14643
- INSTITUTE FOR DEFENSE ANALYSES, ARLINGTON, VA.  
Evaluation of rail rapid transit and express bus service in the urban commuter market  
[PB-265236/0] 15 p0398 N77-28046
- Optimal drawdown strategy for strategic petroleum reserves  
[PB-265838/3] 16 p0512 N77-28569
- DoD energy R and D. Part 2: Military fuel operations. Performance and R and D implications  
[AD-A042272] 16 p0554 N77-33617
- INSTITUTE FOR ENERGY ANALYSIS, OAK RIDGE, TENN.  
Methanol from coal fuel and other applications  
[ORAU-126] 13 p0094 N77-11200
- IEA energy simulation model: A framework for long-range US energy analysis  
[ORAU-125] 13 p0122 N77-14594
- INSTITUTE OF GAS TECHNOLOGY, CHICAGO, ILL.  
Competitively priced hydrogen via high-efficiency nuclear electrolysis  
14 p0171 A77-23720
- Prospects for pipeline delivery of hydrogen as a fuel and as a chemical feedstock  
14 p0200 A77-29437
- Heat transfer analysis of metal hydrides in metal-hydrogen secondary batteries  
15 p0478 A77-33363
- Technical prospects for commercial and residential distribution and utilization of hydrogen  
15 p0283 A77-33404
- Efficiency and cost advantages of an advanced-technology nuclear electrolytic hydrogen-energy production facility  
15 p0302 A77-36344
- Burner design criteria for control of NOx from natural gas combustion. Volume 1: Data analysis and summary of conclusions  
[PB-254167/0] 13 p0091 N77-10686
- Burner design criteria for control of NOx from natural gas combustion. Volume 2: Raw data and experimental results  
[PB-256806/1] 13 p0115 N77-13549
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)  
[FE-2307-2] 14 p0224 N77-19637
- Wind-powered hydrogen electric systems for farm and rural use  
[PB-259318/4] 14 p0226 N77-19667
- Competitively priced hydrogen via high-efficiency nuclear electrolysis  
14 p0237 N77-21558
- The manufacture of hydrogen from coal  
14 p0237 N77-21566
- Laboratory investigations on thermochemical hydrogen production  
14 p0238 N77-21580
- A farm energy system employing hydrogen storage  
14 p0239 N77-21600
- Ocean thermal energy delivery systems based on chemical energy carriers  
14 p0240 N77-21609
- Commodity hydrogen from off-peak electricity  
14 p0245 N77-21641
- Technical prospects for commercial and residential distribution and utilization of hydrogen  
14 p0245 N77-21642
- Initial environmental test plan for source assessment of coal gasification  
[PB-261916/1] 15 p0350 N77-22705
- Assessment application for direct coal combustion  
[PB-263651/2] 15 p0359 N77-24318
- Molten salt thermal energy storage systems: Salt selection  
[COO-2688-1] 15 p0365 N77-24609
- Survey of emissions control and combustion equipment data in industrial process heating  
[PB-263453/3] 15 p0368 N77-24674

- Energy Conversion Alternatives Study (BCAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment [NASA-CR-134955] 15 p0380 A77-26637
- Experimental program for the development of peat gasification [FE-2469-3] 16 p0558 A77-33650
- INSTITUTE OF PHYSICS AND POWER ENGINEERING, OBNIINSK (USSR).  
Operation peculiarities of low temperature heat pipes with crimped capillary structure 13 p0119 A77-14380
- Some features of start-up of alkali metal heat pipes 13 p0119 A77-14383
- Investigations of nonsteady-state processes at cryogenic heat pipe operation 13 p0119 A77-14384
- INTERNATIONAL BUSINESS MACHINES CORP., ROSELLE JUNCTION, N. Y.  
Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149815] 14 p0227 A77-19898
- Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149814] 14 p0227 A77-19899
- INTERNATIONAL FLAME RESEARCH FOUNDATION, IJMUIDEW (NETHERLANDS).  
Burner criteria for NOx control. Volume 1: Influence of burner variables on NOx in pulverized coal flames [PB-259911/6] 14 p0234 A77-20639
- INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS, LAXENBURG (AUSTRIA).  
Energy options open to mankind beyond the turn of the century [IAEA-CN-36/538] 16 p0560 A77-33679
- INTERTECHNOLOGY CORP., WARRENTON, VA.  
InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 1: National solar demonstration program [COO-2688-76-6-VOL-1] 14 p0224 A77-19632
- InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 2: National solar demonstration program [COO-2688-76-6-VOL-2] 14 p0224 A77-19633
- InterTechnology Corporation proposed systems level plan for solar heating and cooling, commercial buildings. Volume 3: National solar demonstration program [COO-2688-76-6-VOL-3] 14 p0224 A77-19634
- Feasibility of meeting the energy needs of army bases with self-generated fuels derived from solar energy plantations [AD-A031163] 14 p0226 A77-19662
- Feasibility of meeting the energy needs of Army bases with self-generated fuels derived from solar energy plantations. Appendixes A, B, and C [AD-A031164] 14 p0226 A77-19663
- ISRAEL ATOMIC ENERGY COMMISSION, YAVNEH.  
The contribution of nuclear technology toward the solution of energy problems [INIS-MF-1867] 13 p0100 A77-11565
- ISTITUTO SUPERIORE DI SANITA, ROME (ITALY).  
Physical and biological aspects of thermal pollution in sea water [ISS-L-75/14] 13 p0109 A77-12560
- JET PROPULSION LAB., CALIF. INST. OF TECH., PASADENA.  
Microwave transmission system for space power 13 p0014 A77-11818
- Onboard hydrogen generation for automobiles 13 p0020 A77-12663
- Economic and engineering implications of the Project Independence 1985 geothermal energy output goal and the associated sensitivity analysis 13 p0029 A77-12745
- Comparison of geothermal power conversion cycles 13 p0030 A77-12750
- Electric utility companies and geothermal power 13 p0031 A77-12759
- Benefits of hydrogen production research 13 p0032 A77-12768
- Comparative performance of solar thermal power generation concepts 13 p0036 A77-12803
- Solar thermal electric power plants - Their performance characteristics and total social costs 13 p0037 A77-12804
- Economic optimization of the energy transport component of a large distributed solar power plant 13 p0037 A77-12807
- A fixed collector employing reversible vee-trough concentrator and a vacuum tube receiver for high temperature solar energy systems 13 p0038 A77-12813
- Comparison of candidate solar array maximum power utilization approaches 13 p0041 A77-12836
- Solar photovoltaics - An aerospace technology [AIAA PAPER 77-293] 13 p0065 A77-18225
- Aerodynamics as a subway design parameter 13 p0070 A77-18721
- The dilemma of future electric power demand 14 p0167 A77-23391
- Thermionic energy conversion technology - Present and future [AIAA PAPER 77-500] 14 p0173 A77-23918
- Consideration of encapsulants for photovoltaic arrays in terrestrial applications 14 p0203 A77-29580
- Performance data for a terrestrial solar photovoltaic/water electrolysis experiment 15 p0256 A77-30321
- Accelerated heat-aging studies on fluororubber in various media 15 p0264 A77-31750
- A simple approach to metal hydride alloy optimization 15 p0281 A77-33388
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 15 p0281 A77-33392
- Crash test of a liquid hydrogen automobile 15 p0282 A77-33397
- The NASA Hydrogen Energy Systems Technology study - A summary 15 p0284 A77-33413
- Hydrogen use projections and supply options 15 p0285 A77-33418
- Institutional and environmental aspects of geothermal energy development 15 p0291 A77-35016
- The sun-tracking control of solar collectors using high-performance step motors 15 p0291 A77-35030
- Silicon solar photovoltaic power stations [AIAA 77-1021] 16 p0404 A77-41563
- Construction and interpretation of a digital inertia image 16 p0421 A77-44464
- ERDA's Chemical Energy Storage Program 16 p0450 A77-48763
- The helical screw expander evaluation project 16 p0456 A77-48809
- Dynamic modeling and sensitivity analysis of solar thermal energy conversion systems 16 p0461 A77-48845
- Tests and evaluation of multihundred watt thermoelectric generators at JPL 16 p0462 A77-48854
- Comparative assessment of orbital and terrestrial central power plants 16 p0465 A77-48878
- Low arc drop hybrid mode thermionic converter 16 p0466 A77-48890
- Solar thermionic power systems for terrestrial applications 16 p0466 A77-48893
- An assessment of wind-powered generators for navigational aids 16 p0468 A77-48900
- Development of low-cost silicon crystal growth techniques for terrestrial photovoltaic solar energy conversion 16 p0485 A77-49052

- Design considerations of solar arrays for terrestrial applications 16 p0485 A77-49053
- Thermal energy storage using large hollow steel ingots 16 p0492 A77-49106
- Hydrogen quantum yields in the 360 nm photolysis of  $\text{Eu}^{2+}$  solutions and their relationship to photochemical fuel formation 16 p0501 A77-50203
- High-efficiency solar concentrator 13 p0083 N77-10104
- A two-dimensional finite difference solution for the transient thermal behavior of tubular solar collector 13 p0083 N77-10105
- Hydrogen-rich gas generator [NASA-CASE-NPO-13560-1] 13 p0086 N77-10636
- LSSA (Low-cost Silicon Solar Array) project [NASA-CR-149091] 13 p0086 N77-10637
- Reduction of gaseous pollutant emissions from gas turbine combustors using hydrogen-enriched jet fuel [NASA-CR-149146] 13 p0094 N77-11198
- Wind power prediction models [NASA-CR-149235] 13 p0105 N77-12509
- Dip coating process: Silicon sheet growth development for the large-area silicon sheet task of the low-cost silicon solar array project [NASA-CR-149242] 13 p0105 N77-12513
- Review of world experience and properties of materials for encapsulation of terrestrial photovoltaic arrays [NASA-CR-149451] 13 p0106 N77-12524
- Solar cell array design handbook, volume 1 [NASA-CR-149364] 13 p0118 N77-14193
- Solar cell array design handbook, volume 2 [NASA-CR-149365] 13 p0118 N77-14194
- Analysis of information systems for hydropower operations: Executive summary [NASA-CR-149342] 13 p0122 N77-14586
- Analysis of information systems for hydropower operations [NASA-CR-149373] 13 p0129 N77-15497
- High-efficiency thin-film GaAs solar cells [PB-258493/6] 14 p0212 N77-17599
- Computer modeling of a regenerative solar-assisted Rankine power cycle 14 p0218 N77-19112
- Precision insolation measurement under field conditions 14 p0219 N77-19113
- Research, development and pilot production of high output thin silicon solar cells [NASA-CR-149858] 14 p0219 N77-19573
- A non-tracking solar energy collector system [NASA-CASE-NPO-13813-1] 14 p0220 N77-19579
- Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149815] 14 p0227 N77-19898
- Silicon ribbon growth by a capillary action shaping technique [NASA-CR-149814] 14 p0227 N77-19899
- Solar energy collection system [NASA-CASE-NPO-13579-2] 14 p0229 N77-20565
- Low cost solar energy collection system [NASA-CASE-NPO-13579-3] 14 p0229 N77-20566
- Status of Goldstone solar energy system study of the first Goldstone energy project 14 p0235 N77-21126
- A simple approach to metal hydride alloy optimization 14 p0243 N77-21624
- New potentials for conventional aircraft when powered by hydrogen-enriched gasoline 14 p0243 N77-21629
- The NASA hydrogen energy systems technology study: A summary 14 p0246 N77-21651
- Hydrogen use projections and supply options 14 p0247 N77-21658
- Hydrogen-enrichment-concept preliminary evaluation [NASA-CR-152814] 15 p0340 N77-22290
- A lightweight solar array study [NASA-CR-152676] 15 p0343 N77-22611
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-152688] 15 p0343 N77-22612
- Solar energy in buildings: Implications for California energy policy [NASA-CR-152686] 15 p0343 N77-22613
- Applications of aerospace technology to petroleum exploration. Volume 1: Efforts and results [NASA-CR-152694] 15 N77-22741
- Applications of aerospace technology to petroleum exploration. Volume 2: Appendices [NASA-CR-152693] 15 p0351 N77-22742
- JPL basic research review [NASA-CR-152689] 15 p0357 N77-23894
- Phase conjugation method and apparatus for an active retrodirective antenna array [NASA-CASE-NPO-13641-1] 15 p0360 N77-24340
- Solar breeder: Energy payback time for silicon photovoltaic systems [NASA-CR-153060] 15 p0362 N77-24581
- Sun tracking solar energy collector [NASA-CASE-NPO-13921-1] 15 p0363 N77-24590
- Program definition for the development of geothermal energy. Volume 1: Background and program definition summary [NASA-CR-153221] 15 p0371 N77-25612
- Program definition for the development of geothermal energy. Volume 2: Program definition development rationale and subprogram descriptions [NASA-CR-153222] 15 p0371 N77-25613
- Program definition for the development of geothermal energy. Volume 3: Appendices [NASA-CR-153223] 15 p0371 N77-25614
- Development of a high efficiency thin silicon solar cell [NASA-CR-153905] 15 p0391 N77-27502
- Automated array assembly task, phase 1 [NASA-CR-153909] 15 p0391 N77-27505
- Borehole hydraulic coal mining system analysis [NASA-CR-154119] 16 p0512 N77-28558
- Options for demonstrating the use of solar energy in California buildings [NASA-CR-154103] 16 p0513 N77-28582
- Lightweight reflector assembly [NASA-CASE-NPO-13707-1] 16 p0518 N77-28933
- Costs and energy efficiency of a dual-mode system [NASA-CR-154251] 16 p0518 N77-29003
- Energy requirement for the production of silicon solar arrays [NASA-CR-153409] 16 p0528 N77-30604
- Development of low cost, high energy-per-unit-area solar cell modules [NASA-CR-153977] 16 p0528 N77-30605
- Solar silicon via improved and expanded metallurgical silicon technology [NASA-CR-153415] 16 p0528 N77-30606
- A review of the solar array manufacturing industry costing standards [NASA-CR-153401] 16 p0528 N77-30608
- Engineering study of the module/array interface for large terrestrial photovoltaic arrays [ERDA/JPL-954698-77/1] 16 p0528 N77-30609
- Comparative thermodynamic performance of some Rankine/Brayton cycle configurations for a low-temperature energy application 16 p0532 N77-31407
- Oil and fat absorbing polymers [NASA-CASE-NPO-11609-2] 16 p0532 N77-31308
- Solar photolysis of water [NASA-CASE-NPO-13675-1] 16 p0544 N77-32580
- Low to high temperature energy conversion system [NASA-CASE-NPO-13510-1] 16 p0545 N77-32581
- Solar energy collection system [NASA-CASE-NPO-13810-1] 16 p0545 N77-32582
- Three-dimensional tracking solar energy concentrator and method for making same [NASA-CASE-NPO-13736-1] 16 p0545 N77-32583
- Evaluation of battery models for prediction of electric vehicle range [NASA-CR-155045] 16 p0546 N77-32593
- An initial comparative assessment of orbital and terrestrial central power systems [NASA-CR-155042] 16 p0546 N77-32594
- Investigation of test methods, material properties and processes for solar cell encapsulants [NASA-CR-155158] 16 p0550 N77-33347



- Compendium of critiques of JPL report SP-43-17:  
Automotive technology status and projections  
project  
[NASA-CR-155180] 16 p0552 N77-33519
- Review of electrochemical impregnation for  
nickel cadmium cells  
[NASA-CR-155155] 16 p0552 N77-33601
- Electrical 2-omega-cm 0.046-cm-thick silicon  
solar cells as a function of intensity and  
temperature  
[NASA-CR-155166] 16 p0553 N77-33604
- JOHNS HOPKINS UNIV., LAUREL, MD.  
Direct-connect tests of hydrogen-fueled  
supersonic combustors  
16 p0440 A77-48240
- JOINT CENTER FOR GRADUATE STUDY, RICHLAND, WASH.  
Investigation of low cost solar cells based on  
Cu<sub>2</sub>O  
[PB-258583/4] 14 p0217 N77-18582
- Investigation of low cost solar cells based on  
Cu<sub>2</sub>O  
[PB-258746/7] 14 p0217 N77-18583
- JOINT ECONOMIC COMMITTEE (U. S. CONGRESS).  
The economics of solar home heating  
[GPO-85-329] 16 p0534 N77-31603
- JOINT PUBLICATIONS RESEARCH SERVICE, ARLINGTON, VA.  
Heat transportation by hot water pipe-lines at  
90 deg C  
[AD-A038301] 16 p0512 N77-28453
- Some thoughts on optimizing long-distance heat  
transport systems and their storage facilities  
[AD-A038253] 16 p0516 N77-28608
- K**
- KAMAN SCIENCES CORP., COLORADO SPRINGS, COLO.  
United States special format report: Report of  
the Phoenix Corporation, city of Colorado  
Springs Solar Heating Project  
[SE-4578-76/1] 15 p0373 N77-25647
- KANHER (LEO) ASSOCIATES, REDWOOD CITY, CALIF.  
Bosch technical instruction. Gasoline injection  
D and L-jetronic  
[NASA-TT-F-17111] 13 p0095 N77-11399
- Investigation of acid-resistant electrocatalysts  
for fuel cells  
[NASA-TT-F-17367] 14 p0207 N77-16444
- The optimum configuration of rotor blades for  
horizontal wind energy converters  
[NASA-TT-F-17379] 14 p0210 N77-17562
- Thermal stability improvement of diesel fuels of  
isopropyloctadecylamine  
[NASA-TT-F-17300] 15 p0388 N77-27242
- LANDSAT (ERTS) used as a basis for geological  
volcanological mapping in the central Andes  
[NASA-TM-75024] 15 p0390 N77-27474
- The relation between isotopic composition of  
argon and carbon in natural gases  
[NASA-TM-75134] 16 p0531 N77-30680
- KANSAS STATE UNIV., MANHATTAN.  
Perspectives in energy: 1976  
[CRS-17] 15 p0372 N77-25636
- KANSAS UNIV. CENTER FOR RESEARCH, INC., LAWRENCE.  
Assessment of fuel-conservation potential of a  
ground-transportation system due to full  
utilization of its mass transportation  
capabilities  
[PB-262125/8] 15 p0347 N77-22657
- KENTUCKY UNIV., LEXINGTON.  
Stage efficiency in the analysis of  
thermochemical water decomposition processes  
13 p0047 A77-13538
- Hydrogen production via thermochemical cycles  
based on sulfur chemistry  
13 p0048 A77-13541
- A thermochemical data bank for cycle analysis  
15 p0276 A77-33346
- Thermodynamic analysis of alternate energy  
carriers, hydrogen and chemical heat pipes  
15 p0279 A77-33374
- Thermochemical hydrogen production via a cycle  
using barium and sulfur - Reaction between  
barium sulfide and water  
15 p0321 A77-38529
- Hot fuel gas desulfurization  
[PB-257036/4] 13 p0133 N77-15539
- Production of ammonia using coal as a source of  
hydrogen  
[PB-259388/7] 14 p0233 N77-20613
- A thermochemical data bank for cycle analysis  
14 p0238 N77-21578
- Technoeconomic analysis of large scale  
thermonuclear production of hydrogen  
[EPRI-EM-287] 16 p0532 N77-31336
- Metallurgical analysis of a plain carbon-steel  
plate after long-term service in a coal gasifier  
[PB-268106/2] 16 p0543 N77-32295
- KERNFORSCHUNGSANLAGE, JUELICH (WEST GERMANY).  
Hydrogen production process by means of nuclear  
energy  
14 p0237 N77-21553
- Physical metallurgy of FeTi-hydride and its  
behavior in a hydrogen storage container  
14 p0242 N77-21620
- KOPPERS CO., INC., PITTSBURGH, PA.  
The K-T process: Koppers commercially proven  
coal and multi-fuel gasifier for synthetic gas  
production in the chemical and fertilizer  
industries  
14 p0237 N77-21567
- KVB ENGINEERING, INC., TUSTIN, CALIF.  
Control of oxides of sulfur from stationary  
sources in the south coast air basin of  
California  
[PB-261754/6] 15 p0348 N77-22668
- Assessment of the potential for energy  
conservation through improved industrial  
boiler efficiency, volume 1  
[PB-262576/2] 15 p0374 N77-25665
- L**
- LABORATOIRES D'ELECTRONIQUE ET DE PHYSIQUE  
APPLIQUEE, LIMBIL-BREVAIRES (FRANCE).  
Cell and module test procedures seen from the  
manufacturer and the user point of view  
16 p0527 N77-30537
- Installation in Dakar of a pump powered by solar  
cell panels  
16 p0546 N77-32589
- LAHOOT-DOHERTY GEOLOGICAL OBSERVATORY, PALISADES,  
N. Y.  
Marine pastures: A by-product of large (100  
megawatt or larger) floating ocean-thermal  
power plants  
[COO-2581-3] 16 p0555 N77-33625
- LEAR MOTORS CORP., RENO, NEV.  
Geothermal hot water pump  
[PB-261741/3] 14 p0251 N77-21711
- Geothermal hot water pump, appendix  
[PB-262030/0] 15 p0347 N77-22652
- LEHIGH UNIV., BETHLEHEM, PA.  
Design of municipal services in support of high  
rise office buildings  
[PB-262532/5] 15 p0370 N77-25021
- LEWIN AND ASSOCIATES, INC., WASHINGTON, D. C.  
The potential and economics of enhanced oil  
recovery  
[PB-254991/3] 13 p0086 N77-10633
- Economic limits of OCS production wells  
[PB-255320/4] 13 p0096 N77-11515
- Research and development in enhanced oil  
recovery. Part 1: Overview  
[ERDA-77-20/1] 16 p0537 N77-31637
- Research and development in enhanced oil  
recovery. Part 2: The program  
[ERDA-77-20/2] 16 p0538 N77-31650
- Research and development in enhanced oil  
recovery. Part 3: The methodology  
[ERDA-77-20/3] 16 p0538 N77-31651
- LIBRARY OF CONGRESS, WASHINGTON, D. C.  
Polar energy resources potential  
[GPO-76-187] 16 p0520 N77-29605
- LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.  
Exploration of molecular sieve zeolites for the  
cooling of building with solar energy  
[PB-266055/3] 16 p0517 N77-28620
- LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS.  
Solar power from satellites  
14 p0146 A77-21751
- A location matrix plan for the residential solar  
heating and cooling demonstration program.  
Volume 1: Findings and recommendations  
[PB-253784/3] 13 p0089 N77-10673
- Study of the feasibility of federal procurement  
of fuels produced from solid wastes  
[PB-255695/9] 13 p0096 N77-11513

- Outlook for research and development in the underground gasification of coal  
[PB-256155/3] 13 p0109 N77-12555
- Outer continental shelf oil and gas costs and production volume: Their impact on the nation's energy balance to 1990  
[PB-262533/3] 15 p0343 N77-22604
- A location matrix plan for the residential solar heating and cooling demonstration program. Volume 2: Procedures and appendices  
[PB-262646/3] 15 p0374 N77-25666
- Environmental considerations of selected energy conserving manufacturing process options. Volume 2: Industry priority report  
[PB-264268/4] 15 p0383 N77-26679
- Environmental considerations of selected energy conserving manufacturing process options. Volume 3: Iron and steel industry report  
[PB-264269/2] 15 p0384 N77-26680
- Environmental considerations of selected energy conserving manufacturing process options. Volume 4: Petroleum refining industry report  
[PB-264270/0] 15 p0384 N77-26681
- Environmental considerations of selected energy conserving manufacturing process options. Volume 5: Pulp and paper industry report  
[PB-264271/8] 15 p0384 N77-26682
- Environmental considerations of selected energy conserving manufacturing process options. Volume 6: Olefins industry report  
[PB-264272/6] 15 p0384 N77-26683
- Environmental considerations of selected energy conserving manufacturing process options. Volume 7: Ammonia industry report  
[PB-264273/4] 15 p0384 N77-26684
- Environmental considerations of selected energy conserving manufacturing process options. Volume 8: Alusina/aluminum industry report  
[PB-264274/2] 15 p0384 N77-26685
- Environmental considerations of selected energy conserving manufacturing process options. Volume 9: Textile industry report  
[PB-264275/9] 15 p0384 N77-26686
- Environmental considerations of selected energy conserving manufacturing process options. Volume 10: Cement industry report  
[PB-264276/7] 15 p0384 N77-26687
- Environmental considerations of selected energy conserving manufacturing process options. Volume 11: Glass industry  
[PB-264277/5] 15 p0384 N77-26688
- Environmental considerations of selected energy conserving manufacturing process options. Volume 12: Chlor-alkali industry report  
[PB-264278/3] 15 p0385 N77-26689
- Environmental considerations of selected energy conserving manufacturing process options. Volume 13: Phosphoric acid industry report  
[PB-264279/1] 15 p0385 N77-26690
- Environmental considerations of selected energy conserving manufacturing process options. Volume 14: Primary copper industry report  
[PB-264280/9] 15 p0385 N77-26691
- Environmental considerations of selected energy conserving manufacturing process options. Volume 15: Fertilizer industry report  
[PB-264281/7] 15 p0385 N77-26692
- National benefits/costs of enhanced oil recovery research  
[PB-2021-4] 16 p0538 N77-31649
- Gas cooled reactor assessment, volume 1  
[TID-27424-VOL-1] 16 p0541 N77-31945
- Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Boss Corporation  
[PB-268232/6] 16 p0542 N77-32051
- Evaluation of the disposal of flue gas desulfurization wastes in mines and the ocean: Initial assessment  
[PB-269270/5] 16 p0561 N77-34058
- LOCKHEED-CALIFORNIA CO., BURBANK.**
- Experimental data and theoretical analysis of an operating 100 kW wind turbine  
16 p0467 A77-48898
- LR2 airport requirements study  
[NASA-CR-2700] 13 p0083 N77-10032
- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137926] 13 p0126 N77-15007
- Study of the cost/benefit tradeoffs for reducing the energy consumption of the commercial air transportation system  
[NASA-CR-137927] 13 p0126 N77-15008
- A 100-kW metal wind turbine blade basic data, loads and stress analysis  
[NASA-CR-134956] 14 p0236 N77-21467
- A 100-kW wind turbine blade dynamics analysis, weight-balance, and structural test results  
[NASA-CR-134957] 14 p0236 N77-21468
- LOCKHEED ELECTRONICS CO., HOUSTON, TX.**
- Program document for Energy Systems Optimization Program 2 (ESOP2). Volume 1: Engineering manual  
[NASA-CR-151422] 15 p0372 N77-25631
- LOCKHEED MISSILES AND SPACE CO., HUNTSVILLE, ALA.**
- Cryogenic temperature control by means of energy storage materials  
[AIAA PAPER 77-763] 15 p0312 A77-37273
- Heat pumps: Substitutes for outmoded fossil-fueled systems  
[PB-266218/7] 16 p0524 N77-29638
- LOCKHEED MISSILES AND SPACE CO., PALO ALTO, CALIF.**
- Effectiveness of heat-emitting coatings with variable degree of blackness  
13 p0111 N77-12893
- Use of radiation reflected from earth to increase the power of solar panels  
15 p0363 N77-24586
- Development of plastic honeycomb flat-plate solar collectors  
[SAR/1081-76/1] 15 p0372 N77-25640
- Electromechanical stabilization system  
16 p0511 N77-28211
- LOCKHEED MISSILES AND SPACE CO., SUNNYVALE, CALIF.**
- SEP solar array technology development  
13 p0040 A77-12825
- SEP full-scale wing technology development  
16 p0463 A77-48860
- LOGISTICS MANAGEMENT INST., WASHINGTON, D. C.**
- Project Independence Evaluation System (PIES) documentation. Volume 1: The integrating model of the Project Independence Evaluation System  
[PB-263020/0] 15 p0374 N77-25661
- LOS ALAMOS SCIENTIFIC LAB., N. MEX.**
- Geothermal energy for power generation  
[LA-UR-76-369] 13 p0087 N77-10650
- Geothermal energy for electrical and nonelectrical applications  
[LA-UR-76-418] 13 p0123 N77-14601
- Energy storage and transfer with homopolar machine for a linear theta-pinch hybrid reactor  
[LA-6174] 14 p0214 N77-17892
- Preliminary assessment of a geothermal energy reservoir formed by hydraulic fracturing  
[LA-UR-76-1672] 14 p0221 N77-19597
- Extracting energy from hydraulically-fractured geothermal reservoirs  
[LA-UR-76-848] 14 p0221 N77-19598
- Commercial application of laser fusion  
[LA-UR-76-1459] 14 p0227 N77-19872
- Ultra high-current superconducting cables for a 2.2-Tesla, 300-kilojoule energy storage magnet  
[LA-UR-76-1809] 14 p0235 N77-21325
- Hydrogen safety problems  
14 p0245 N77-21640
- Geothermal chemistry activities at LASL  
[LA-6448-PR] 15 p0344 N77-22623
- Technology assessment of laser-fusion power production  
[LA-UR-76-2060] 15 p0351 N77-22975
- Ceramic heat pipe heat exchangers  
[LA-6514-MS] 15 p0361 N77-24431
- Summary description of the BOOM1 model  
[LA-6424-MS] 15 p0369 N77-25010
- LASL hot dry rock geothermal project  
[LA-6525-PR] 15 p0372 N77-25639
- Superconducting energy storage development for electric utility systems  
[LA-UR-76-2294] 15 p0381 N77-26649
- Aerosol research and development related to health hazards analysis  
[LA-6539-PR] 15 p0385 N77-26703

Design of multifilamentary Nb<sub>3</sub>Sn superconductor tailored to the requirements of a dc superconducting power transmission line [LA-UR-77-99] 15 p0389 N77-27311

Pulsed energy and switching requirements for Tokamak chaotic heating [LA-UR-76-2473] 15 p0397 N77-27932

Superconducting magnetic energy storage [LA-UR-76-2047] 15 p0397 N77-27933

Applications of superconductivity in electric power systems [LA-UR-76-1998] 15 p0398 N77-27996

Gas-interface studies in large horizontal heat pipes [LA-6646-MS] 16 p0520 N77-29455

Methodology for the analysis of the impacts of electric power production in the West [LA-6720-PR] 16 p0533 N77-31428

Accounting systems for energy conservation [LA-6569-MS] 16 p0557 N77-33646

LOUGHBOROUGH UNIV. OF TECHNOLOGY (ENGLAND). Assessment of the role of the liquefied petroleum gas (LPG) engine in stage carriage service vehicles [TT-7605] 16 p0519 N77-29320

LOUISIANA STATE UNIV., BATON ROUGE. Oil and gas use characterization, impacts, and guidelines [TT-265267/5] 16 p0516 N77-28610

LOUHUS CO., NEW YORK. Hot and dry char let down system for the Synthane demonstration plant, phase 1 [PERC-0058-4] 13 p0130 N77-15505

## M

MAGNETIC CORP. OF AMERICA, WALTHAM, MASS. Design study of superconducting magnets for a combustion magnetohydrodynamic (MHD) generator [NASA-CR-135178] 14 p0234 N77-20886

MAINE UNIV., ORONO. Ternary compound thin film solar cells [PB-262536/6] 15 p0374 N77-25662

Ternary compound thin film solar cells - 1 [PB-265003/4] 15 p0395 N77-27561

Proceedings of the ERDA Semiannual Solar photovoltaic Program Review Meeting [CONF-760837-P2] 16 p0555 N77-33628

MARCONI-ELLIOTT AVIONIC SYSTEMS LTD., ROCHESTER (ENGLAND). Aircraft power supplies and cooling problems: A viewpoint from the power conditioner designer 14 p0207 N77-16039

MARTIN MARIETTA CORP., BALTIMORE, MD. Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-267937/1] 16 p0554 N77-33619

MARTIN MARIETTA CORP., DENVER, COLO. Definition study for photovoltaic residential prototype system [NASA-CR-135056] 13 p0113 N77-13533

Central receiver solar thermal power system, phase 1 [SAN/1110-76/T1] 14 p0216 N77-18570

Central receiver solar thermal power system, phase 1 [SAN/1110-76/T2] 14 p0248 N77-21668

Orbital construction support equipment [NASA-CR-151460] 15 p0388 N77-27157

Central receiver solar thermal power system, phase 1 [SAN/1110-76/1] 15 p0394 N77-27550

Central receiver solar thermal power system, phase 1 [SAN/1110-76/2] 15 p0394 N77-27551

The assembly of large structures in space 16 p0524 N77-29770

ERDA's central receiver solar thermal power system studies 16 p0526 N77-30279

Technology requirements for advanced earth-orbital transportation systems: Summary report [NASA-CR-2867] 16 p0550 N77-33255

MARTIN MARIETTA LABS., BALTIMORE, MD. Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-261910/4] 15 p0350 N77-22688

MARYLAND UNIV., COLLEGE PARK. Flywheel energy storage. II - Magnetically suspended superflywheel 15 p0323 A77-39415

CCMS solar energy pilot study solar heating and cooling systems in buildings [UMD-4908-5] 13 p0088 N77-10657

Optimization studies of solar absorption air conditioning systems [NSF/RANN/SE/GI-39117/PR-76/2] 14 p0250 N77-21690

Proceedings of the Solar Industrial Process Heat Workshop [CONF-760655] 15 p0373 N77-25643

MASCHINENFABRIK AUGSBURG-MUERNBERG A.G., MUNICH (WEST GERMANY). Energy accumulation through stationary flywheel systems [BHFT-PB-T-76-58] 16 p0522 N77-29620

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. Photoassisted electrolysis of water - Conversion of optical to chemical energy 13 p0021 A77-12666

Some dynamic problems of rotating windmill systems 13 p0084 N77-10271

The supply of coal in the long run: The case of eastern deep coal [PB-252642/4] 13 p0086 N77-10626

Basic studies of coal pyrolysis and hydrogasification [PB-254878/2] 13 p0096 N77-11511

Air quality considerations in transportation planning: Findings and recommendations on transportation control planning, phase 2 [PB-256424/3] 13 p0110 N77-12576

Wind energy conversion [PB-256198/3] 13 p0115 N77-13552

Federal support for the development of alternative automotive power systems: The general issue and the stirling, diesel, and electric cases [PB-263523/3] 15 p0354 N77-23518

Methanol as an automotive fuel: A summary of research in the M.I.T. Energy Laboratory [PB-262980/6] 15 p0356 N77-23619

OPEC and the monopoly price of world oil (World Oil Project) [PB-265015/8] 16 p0518 N77-29001

Optimization models for planning economic development [AD-A039165] 16 p0531 N77-31024

A user's guide to the MIT world energy demand data base. Part 2: Data index [PB-266830/9] 16 p0539 N77-31660

Wind energy conversion [PB-268718/4] 16 p0559 N77-33667

MASSACHUSETTS INST. OF TECH., OAK RIDGE, TENN. Design considerations for capillary heat pipes at cryogenic temperatures [ORNL-MIT-28] 15 p0361 N77-24430

MASSACHUSETTS UNIV., AMHERST. Investigation of the feasibility of using windpower for space heating in colder climates. The final design and manufacturing phase of the project [ERDA/NSF-00603/75/T1] 14 p0215 N77-18561

MATERIALS RESEARCH LABS., MARIYBNONG (AUSTRALIA). XRF analysis of some regenerated catalysts [MRL-TN-388] 15 p0376 N77-26247

MATHEMATICA, INC., PHILADELPHIA, PA. Sources of energy data for Illinois [PB-262562/2] 15 p0350 N77-22686

MATHEMATICA, INC., PRINCETON, N. J. Comparative state-of-the-art assessment of gas supply modeling [EPRI-BA-201] 16 p0539 N77-31656

MATHEMATICAL SCIENCES NORTHWEST, INC., BELLEVUE, WASH. A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 1 [PB-264705/5] 15 p0383 N77-26677

- A social and economic impact study of offshore petroleum and natural gas development in Alaska, phase 2  
[PB-26476/3] 15 p0385 N77-26693
- MATHEMATICS AND COMPUTATION LAB., WASHINGTON, D. C.  
The intersectoral feedback model  
[PB-255659/1] 13 p0125 N77-14950
- MATHECH, INC., PRINCETON, N. J.  
Evaluation of current surface coal mining overburden handling techniques and reclamation practices  
[PB-264111/6] 15 p0372 N77-25625
- MCDONNELL-DOUGLAS ASTRONAUTICS CO., BUNTINGTON BEACH, CALIF.  
Space construction base support requirements for environmental control and life support systems  
[ASME PAPER 77-ENAS-44] 16 p0432 A77-46885  
Space construction base operations in support of solar power satellite development  
16 p0468 A77-48907
- Space station systems analysis study. Part 1, volume 1: Executive study  
[NASA-CR-151102] 13 p0094 N77-11084
- Space station systems analysis study. Part 1, volume 2: Technical report  
[NASA-CR-151103] 13 p0094 N77-11085
- Central receiver solar thermal system, phase 1, CPRL item 10  
[SAN/1108-76/2] 14 p0231 N77-20591
- Space station systems analysis study. Part 3: Documentation. Volume 1: Executive summary  
[NASA-CR-151503] 16 p0525 N77-30151
- MCDONNELL-DOUGLAS ASTRONAUTICS CO., RICHLAND, WASH.  
Heat pipes for the trans-Alaska pipeline  
13 p0120 N77-14388
- MCKEE (ARTHUR G.) AND CO., CLEVELAND, OHIO.  
Utilization of low and intermediate BTU gas from coal for iron ore pelletizing  
[PB-264702/2] 15 p0389 N77-27247
- MECKLER (GERSHON) ASSOCIATES, WASHINGTON, D. C.  
CONSULTING ENGINEERS, WASHINGTON, D. C.  
Study of the application of solar chemical dehumidification system to wind tunnel facilities of NASA Lewis Research Center at Cleveland, Ohio  
[NASA-CR-149886] 14 p0227 N77-20116
- Application of chemical dehumidification system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana  
[NASA-CR-149888] 14 p0228 N77-20560
- Application of a run around coil system to a roof fan house at Michoud Assembly Facility at New Orleans, Louisiana  
[NASA-CR-149887] 14 p0229 N77-20561
- Summary report of technical discussion, NASA-ERDA solar energy proposal  
14 p0229 N77-20562
- MEMPHIS STATE UNIV., TENN.  
Optimization of absorption air-conditioning for solar energy applications  
[NASA-CR-150176] 14 p0210 N77-17560
- Thermal effects on biodegradation of pollutants in water  
[PB-261512/8] 15 p0350 N77-22709
- MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., MUEBICH (WEST GERMANY).  
The intermittent jet for supersonic conditions increased with passage to operating in a ramjet - A low cost engine  
15 p0339 N77-22130
- MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., OTTOBRUNN (WEST GERMANY).  
AMPS - subsatellite assessment study, volume 1  
[MBS-UBV-91-76-VOL-1] 15 p0354 N77-23175
- METEOLOGY RESEARCH, INC., ALTADENA, CALIF.  
The chemistry, dispersion, and transport of air pollutants emitted from fossil fuel power plants in California  
[PB-254449/2] 13 p0092 N77-10720
- MIAMI UNIV., CORAL GABLES, FLA.  
First World Hydrogen Energy Conference proceedings, volume 1  
14 p0237 N77-21552
- First World Hydrogen Energy Conference proceedings, volume 2  
14 p0238 N77-21591
- First World Hydrogen Energy Conference proceedings, volume 3  
14 p0243 N77-21626
- Analysis of a Delphi study on hydrogen  
14 p0246 N77-21649
- Economics of nuclear - electrolytic hydrogen  
14 p0247 N77-21659
- A simplified equilibrium model of the US energy-economic system and its use in comparing alternatives  
14 p0247 N77-21662
- MIAMI UNIV., FLA.  
Water electrolysis under pressure: Improvement of energy efficiency by temperature increase  
14 p0238 N77-21594
- Bioconversion of solar energy in salt water: Photosynthetic hydrogen production systems  
14 p0239 N77-21603
- MICHIGAN GOVERNOR'S COMMISSION ON ELECTRIC POWER ALTERNATIVES, LANSING.  
Report of the Advisory Commission on Electric Power Alternatives  
[PB-268479/3] 16 p0559 N77-33668
- MICHIGAN STATE UNIV., EAST LANSING.  
Application study of wind power technology to the city of Hart, Michigan  
[COO-2603-1] 14 p0212 N77-17582
- MICHIGAN TECHNOLOGICAL UNIV., BOURBON.  
Energy and protein production from pulp mill wastes  
[COO-2983-2] 16 p0557 N77-33645
- MICHIGAN UNIV., ANN ARBOR.  
Perspectives on the evolution into a hydrogen economy  
14 p0246 N77-21652
- MIDDLE ATLANTIC GOVERNORS' COASTAL RESOURCES COUNCIL.  
Identification and analysis of mid-Atlantic onshore OCS impact  
[PB-254925/1] 13 p0096 N77-11516
- MIDWEST RESEARCH INST., KANSAS CITY, MO.  
Performance of emission control devices on boilers firing municipal solid waste and oil  
[PB-257136/2] 13 p0133 N77-15550
- Fine shredding of municipal solid waste  
[PB-257105/7] 13 p0133 N77-15919
- Comprehensive report and investigation on helium uses  
[PB-263515/9] 15 p0370 N77-25280
- System study of fuels from grains and grasses  
[DSE/3729-1] 16 p0519 N77-29318
- MILITARY ACADEMY, WEST POINT, N. Y.  
Effects of a thermal reactor on the energy efficiency of a turbocharged, stratified charge engine  
[AD-A026059] 13 p0128 N77-15409
- MINNESOTA UNIV., AUSTIN.  
Radiative characteristics of metallic particle coatings and their applications in selective solar energy collectors  
16 p0545 N77-32587
- MINNESOTA UNIV., MINNEAPOLIS.  
Solar power arrays for the concentration of energy  
[COO-2699-2] 13 p0087 N77-10651
- MISSISSIPPI STATE UNIV., MISSISSIPPI STATE.  
Flight test evaluation of a method to determine the level flight performance of a propeller-driven aircraft  
[SAB PAPER 770470] 15 p0310 A77-37088
- MISSOURI UNIV., COLUMBIA.  
Development of a new silicon Schottky photovoltaic energy converter  
[PB-262491/4] 15 p0373 N77-25654
- MITRE CORP., BEDFORD, MASS.  
Wind machines  
[NSF/RA/N-75-051] 16 p0529 N77-30620
- MITRE CORP., MCLEAN, VA.  
Survey of alcohol fuel technology, volume 1  
[PB-256007/6] 13 p0112 N77-13232
- Survey of alcohol fuel technology, volume 2  
[PB-256008/4] 13 p0112 N77-13233
- Proceedings of National Conference on Health, Environmental Effects, and Control Technology of Energy Use  
[PB-256845/9] 14 p0208 N77-16453
- Methodology for ranking geothermal reservoirs in non-electric industrial applications  
[MTR-7241] 14 p0222 N77-19610
- Geothermal energy resource utilization program planning  
[MTR-7137] 14 p0249 N77-21683

## CORPORATE SOURCE INDEX

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.

Environmental assessment sampling and analytical strategy program  
[PB-261259/6] 15 p0352 N77-23021

Solar energy government buildings program policy and implementation plan  
[PB-262841/0] 15 p0366 N77-24622

EPA and EREA high-temperature/high-pressure particulate control programs  
[PB-266231/0] 16 p0517 N77-28644

Analysis of energy projections for infrastructure development requirements  
[PB-266419/1] 16 p0524 N77-29640

Economic analysis of solar water and space heating [DSE/2322-1-SUPPL] 16 p0536 N77-31627

Interagency energy/environment research and development program: Status report 3  
[PB-267443/0] 16 p0558 N77-33662

Public participation in energy related decision making, edited transcripts  
[PB-268781/2] 16 p0559 N77-33674

MONSANTO RESEARCH CORP., DAYTON, OHIO.  
PCB emissions from stationary sources: a theoretical study  
[PB-262850/1] 15 p0367 N77-24665

Design of minimum-weight diffusion batteries  
[PB-266217/9] 16 p0518 N77-28645

MONTANA DEPT. OF HEALTH AND ENVIRONMENTAL SCIENCES, HELENA.  
Alluvial valley floors in east-central Montana and their relation to stripable coal reserves. A reconnaissance report  
[PB-267280/6] 16 p0540 N77-31725

MORRISON-UND TURBINES-UNION RUENCHEN G.M.B.H. (WEST GERMANY).  
Advanced engine design concepts and their influence on the performance of multi-role combat aircraft  
15 p0339 N77-22116

Experience with a one stage variable geometry axial turbine  
15 p0340 N77-22143

MUNICIPAL ENVIRONMENTAL RESEARCH LAB., CINCINNATI, OHIO.  
Fuel and energy production by bioconversion of waste materials: State-of-the-art  
[PB-258499/3] 14 p0219 N77-19279

MUSASHI INST. OF TECH., TOKYO (JAPAN).  
Development of a liquid hydrogen car  
14 p0244 N77-21632

## N

NAPLES UNIV. (ITALY).  
Wetting and surface properties of refrigerants to be used in heat pipes  
13 p0119 N77-14386

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION, WASHINGTON, D. C.  
Public participation in energy related decision making, edited transcripts  
[PB-268781/2] 16 p0559 N77-33674

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.  
Fuels and fuel additives for highway vehicles and their combustion products. Guide to evaluation of their potential effects on health  
[PB-254088/8] 13 p0084 N77-10222

Drilling for energy resources  
[PB-259206/1] 14 p0235 N77-20972

Energy for rural development: Renewable resources and alternative technologies for developing countries  
[PB-260606/9] 14 p0251 N77-21716

Technology transfer from foreign direct investment in the United States. Report of a seminar series  
[PB-263012/7] 15 p0358 N77-24018

Report of the National Research Council Committee on Nuclear and Alternative Energy Systems  
[PB-263595/1] 15 p0367 N77-24633

Report of the subcommittee on energy-related atomic and molecular science  
[PB-264052/2] 15 p0375 N77-25673

The potential of lignocellulosic materials for the production of chemicals, fuels, and energy  
[PB-264458/1] 15 p0385 N77-26698

Energy consumption measurement: Data needs for public policy  
[PB-266039/7] 16 p0517 N77-28619

National Research Council Committee on Nuclear and Alternative Energy Systems  
[TID-27435] 16 p0538 N77-31655

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.  
NASA thermionic-conversion program  
13 p0043 A77-12863

NASA electric propulsion program  
[AIAA PAPER 76-1068] 13 p0045 A77-13033

Space solar power - An available energy source  
13 p0056 A77-15946

LTA - Recent developments  
13 p0061 A77-17021

Status of the NASA Space Power Program  
[AIAA PAPER 77-505] 14 p0173 A77-23922

The next 25 years: Industrialization of space - Rationale for planning  
15 p0322 A77-38792

The NASA Energy Conservation Program  
[AIAA PAPER 77-1005] 16 p0405 A77-41571

A view of the future - Constraints and opportunities  
16 p0410 A77-41944

Technology for power in space  
16 p0463 A77-48865

Aircraft fuel conservation technology. Task force report, September 10, 1975  
[NASA-TM-X-74295] 13 p0093 N77-11055

Air transportation beyond the 1980's  
13 p0117 N77-13984

Safety flywheel  
[NASA-CASE-HQN-10888-1] 15 p0342 N77-22484

Spinoff 1977: An annual report  
[NASA-TM-74908] 16 p0561 N77-34049

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. AMES RESEARCH CENTER, MOFFETT FIELD, CALIF.  
Air transportation energy efficiency - Alternatives and implications  
[SAWE PAPER 1124] 13 p0016 A77-12192

Flap-augmented shrouds for aerogenerators  
14 p0183 A77-26085

Potential structural material problems in a hydrogen energy system  
15 p0281 A77-33389

Sulfidation of 310 stainless steel at sulfur potentials encountered in coal conversion systems  
15 p0337 A77-40028

Some studies on a solid state sulfur probe for coal gasification systems  
[NASA-TM-78428] 16 p0534 N77-31605

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD INST. FOR SPACE STUDIES, NEW YORK.  
Space technology in the discovery and development of mineral and energy resources  
16 p0526 N77-30289

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.  
Thermographic mosaic of Yellowstone National Park  
p0001 A77-10121

Energetics of the midlatitude thermosphere  
13 p0012 A77-11492

The ATS-6 power system - Hardware implementation and orbital performance  
13 p0040 A77-12831

Survey of quantitative data on the solar energy and its spectra distribution  
13 p0072 A77-19044

Effects of one-sided heat input and removal on axially grooved heat pipe performance  
[AIAA PAPER 77-191] 14 p0135 A77-19887

Flywheel energy storage. II - Magnetically suspended superflywheel  
15 p0323 A77-39315

Axially grooved heat pipes - 1976  
[AIAA PAPER 77-747] 15 p0324 A77-39512

Development of a low temperature phase change material package  
[AIAA PAPER 77-762] 15 p0325 A77-39514

Insolation data for solar energy conversion derived from satellite measurements of earth radiance  
16 p0471 A77-48930

Experimental and theoretical studies on solar energy for energy conversion  
16 p0471 A77-48932

- The International Heat Pipe Experiment  
13 p0120 N77-14389
- Results from the INP-J violet solar cell  
experiment and violet cell balloon flights  
[NASA-TN-D-8393] 13 p0128 N77-15491
- The ATS-6 power system: Hardware implementation  
and orbital performance  
[NASA-TP-1023] 16 p0543 N77-32229
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.  
LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEX.
- Solar power satellite transportation  
14 p0205 A77-30016
- Space solar power - The transportation challenge  
[AIAA PAPER 77-529] 15 p0266 A77-32054
- Potential structural material problems in a  
hydrogen energy system  
15 p0281 A77-33389
- Solar power satellite concepts and potential  
related space systems  
16 p0463 A77-48870
- Space power stations - Space construction,  
transportation, and pre-development, space  
project requirements  
[IAF PAPER 77-64] 16 p0506 A77-51415
- Performance characteristics of a diesel engine  
using low- and medium-energy gases as a fuel  
supplement (fumigation)  
[NASA-TM-X-58188] 13 p0126 N77-14955
- Initial technical, environmental, and economic  
evaluation of space solar power concepts.  
Volume 1: Summary  
[NASA-TM-X-74309] 14 p0207 N77-16442
- Initial technical environmental, and economic  
evaluation of space solar power concepts.  
Volume 2: Detailed report  
[NASA-TM-X-74310] 14 p0207 N77-16443
- Solar power satellite: Analysis of alternatives  
for transporting material to geosynchronous  
orbit  
[NASA-TM-X-74680] 14 p0235 N77-21136
- Design techniques for modular integrated utility  
systems  
[NASA-TM-X-58189] 14 p0253 N77-22005
- Critical areas: Satellite power systems concepts  
[NASA-TM-X-74694] 15 p0362 N77-24585
- Study of Lyndon B. Johnson Space Center utility  
systems  
[NASA-TM-58196] 15 p0388 N77-27161
- Solar power satellite. Concept evaluation.  
Activities report. Volume 2: Detailed report  
[NASA-TM-74942] 16 p0552 N77-33600
- Preliminary design study of a baseline M10S  
[NASA-TM-X-58193] 16 p0561 N77-34050
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. JOHN  
F. KENNEDY SPACE CENTER, COCOA BEACH, FLA.
- Risk management of liquefied natural gas  
installations  
13 p0002 A77-10451
- Potential structural material problems in a  
hydrogen energy system  
15 p0281 A77-33389
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.  
LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.
- Application of advanced technology to future  
long-range aircraft  
[SAWE PAPER 1126] 13 p0016 A77-12194
- Hypersonic technology-approach to an expanded  
program  
13 p0051 A77-14597
- Technical highlights in general aviation  
[AIAA PAPER 77-312] 13 p0066 A77-18237
- Design application using solar energy to control  
the environment in a major office building  
14 p0168 A77-23442
- The thermal efficiency and cost of producing  
hydrogen and other synthetic aircraft fuels  
from coal  
14 p0171 A77-23718
- Energy and economic trade offs for advanced  
technology subsonic aircraft  
14 p0201 A77-29471
- Some early perspectives on ground requirements  
of liquid hydrogen air transports  
15 p0281 A77-33391
- The aircraft energy efficiency active controls  
technology program  
[AIAA 77-1076] 16 p0415 A77-42784
- The liquid hydrogen option for the subsonic  
transport - A status report  
16 p0458 A77-48819
- Initial operation of a solar heating and cooling  
system in a full-scale solar building test  
facility  
16 p0498 A77-49164
- Advances in engineering science, volume 3  
[NASA-CP-2001-VOL-3] 13 p0084 N77-10305
- Solar hot water systems application to the solar  
building test facility and the Tech House  
13 p0084 N77-10342
- Hydrogen-fueled subsonic aircraft: A perspective  
13 p0084 N77-10344
- Auxiliary power system for activity cooled  
aircraft  
[NASA-CASE-LAR-11626-1] 13 p0103 N77-12332
- NASA Office of Aeronautics and Space Technology  
Summer Workshop. Volume 4: Power technology  
panel  
[NASA-TM-X-73964] 13 p0117 N77-13913
- The design of a solar energy collection system  
to augment heating and cooling for a  
commercial office building  
[NASA-TM-X-72753] 14 p0207 N77-16446
- The thermal efficiency and cost of producing  
hydrogen and other synthetic aircraft fuels  
from coal  
14 p0243 N77-21627
- Some early perspectives on ground requirements  
of liquid hydrogen air transports  
14 p0243 N77-21628
- Design of a large span-distributed load  
flying-wing cargo airplane  
[NASA-TM-X-74031] 15 p0353 N77-23089
- NASA Technology Utilization House technical  
support package  
[NASA-TM-X-74686] 15 p0358 N77-24011
- Static and wind-on tests of an  
upper-surface-blown jet-flap nozzle  
arrangement for use on the Quiet Clean  
Short-haul Experimental Engine (QCEB)  
[NASA-TM-D-8476] 15 p0370 N77-25086
- Alternate aircraft fuels: Prospects and  
operational implications  
[NASA-TM-X-74030] 16 p0511 N77-28322
- An annotated bibliography, volume 1, appendix 2  
[NASA-TM-74765] 16 p0513 N77-28577
- An annotated bibliography, volume 2, appendix 2  
[NASA-TM-74764] 16 p0513 N77-28578
- An overview of concepts for aircraft drag  
reductions  
16 p0543 N77-32092
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.  
LEWIS RESEARCH CENTER, CLEVELAND, OHIO.
- NASA thermionic-conversion program  
13 p0043 A77-12863
- NASA electric propulsion program  
[AIAA PAPER 76-1068] 13 p0045 A77-13033
- Photovoltaic test and demonstration project  
14 p0153 A77-21838
- The computer simulation of automobile use  
patterns for defining battery requirements for  
electric cars  
14 p0159 A77-22879
- Clean fuels from biomass  
14 p0167 A77-23390
- Thermionic energy conversion technology -  
Present and future  
[AIAA PAPER 77-500] 14 p0173 A77-23918
- Status of silicon solar cell technology  
14 p0184 A77-26392
- Synchronization of the ERDA-NASA 100 kw wind  
turbine generator with large utility networks  
15 p0267 A77-32243
- Potential structural material problems in a  
hydrogen energy system  
15 p0281 A77-33389
- Energy storage possibilities of atomic hydrogen  
15 p0283 A77-33405
- Two-phase working fluids for the temperature  
range 100-350 C  
[AIAA PAPER 77-753] 15 p0312 A77-37266
- Re-entrant groove heat pipe  
[AIAA PAPER 77-773] 15 p0312 A77-37280
- Experimental solar heating-cooling system model  
tests of a full-scale building system  
15 p0319 A77-38224

Results of closed cycle MHD power generation tests with a helium-cesium working fluid 15 p0326 A77-39533

Thermal storage for electric utilities [ATAA 77-1009] 16 p0403 A77-41556

Optimization of confinement in a toroidal plasma subject to strong radial electric fields 16 p0438 A77-47958

The NASA thermionic-conversion /TEC-AR1/ program 16 p0438 A77-47960

Molten salt thermal energy storage for utility peaking loads 16 p0451 A77-48765

NASA Thermionic-Conversion program 16 p0466 A77-48886

Experimental data and theoretical analysis of an operating 100 kW wind turbine 16 p0467 A77-48898

Fundamental studies of black chrome for solar collector use 16 p0498 A77-49160

Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator 16 p0498 A77-49161

Performance correlations of five solar collectors tested simultaneously outdoors 16 p0498 A77-49162

An experimental investigation with artificial sunlight of a solar hot-water heater 16 p0498 A77-49163

Initial operation of a solar heating and cooling system in a full-scale solar building test facility 16 p0498 A77-49164

Measured performance of a 3-ton LiBr absorption water chiller and its effect on cooling system operation 16 p0498 A77-49165

Preliminary report on the CTS transient event counter performance through the 1976 spring eclipse season [NASA-TM-X-73487] 13 p0083 N77-10116

Status of SERT 2 thrusters and spacecraft 1976 [NASA-TM-X-73501] 13 p0083 N77-10149

Early operation experience on the ERDA/NASA 100 kW wind turbine [NASA-TM-X-71601] 13 p0086 N77-10640

A summary of the ECAS MHD power plant results [NASA-TM-X-73491] 13 p0086 N77-10642

Evaluation of potassium titanate as a component of alkaline fuel cell matrices [NASA-TM-D-8341] 13 p0094 N77-11175

Test program for transmitter experiment package and heat pipe system for the communications technology satellite [NASA-TM-X-3455] 13 p0095 N77-11268

Optimized selective coatings for solar collectors [NASA-TM-X-73498] 13 p0097 N77-11529

Evaluation of flat-plate collector efficiency under controlled conditions in a solar simulator [NASA-TM-X-73520] 13 p0097 N77-11530

Emissions and performance of catalysts for gas turbine catalytic combustors [NASA-TM-X-73543] 13 p0104 N77-12406

Space-to-earth power transmission system [NASA-TM-X-73489] 13 p0105 N77-12517

Measured performance of a 3 ton LiBr absorption water chiller and its effect on cooling system operation [NASA-TM-X-73496] 13 p0105 N77-12518

Status of silicon solar cell technology [NASA-TM-X-73531] 13 p0106 N77-12519

Outdoor performance results for NBS Round Robin collector no. 1 [NASA-TM-X-73547] 13 p0106 N77-12520

Temperature distribution of a hot water storage tank in a simulated solar heating and cooling system [NASA-TM-X-73549] 13 p0106 N77-12521

The Redox flow system for solar photovoltaic energy storage [NASA-TM-X-73562] 13 p0106 N77-12522

Analysis of epitaxial drift field N on P silicon solar cells [NASA-TM-X-73563] 13 p0106 N77-12523

Cost/benefit assessment of the application of composite materials to subsonic commercial transport engines [NASA-TM-X-73557] 13 p0111 N77-13064

Automotive gas turbine fuel control [NASA-CASE-LEW-12785-1] 13 p0113 N77-13426

Wind tunnel measurements of the tower shadow on models of the ERDA/NASA 100 kW wind turbine tower [NASA-TM-X-73548] 13 p0114 N77-13534

Standardized performance tests of collectors of solar thermal energy - A flat-plate copper collector with parallel mylar striping [NASA-TM-X-73553] 13 p0114 N77-13535

Standardized performance tests of collectors of solar thermal energy: An evacuated flatplate copper collector with a serpentine flow distribution [NASA-TM-X-73415] 13 p0114 N77-13536

Status of the ERDA/NASA photovoltaic tests and applications project [NASA-TM-X-73567] 13 p0114 N77-13537

Electrically rechargeable REDOX flow cell [NASA-CASE-LEW-12220-1] 13 p0121 N77-14581

New separators for nickel-zinc batteries [NASA-TM-X-3465] 13 p0121 N77-14585

Effect of ceramic coating of J78D combustor liner on maximum liner temperatures and other combustor performance parameters [NASA-TM-X-73581] 13 p0126 N77-15037

Bibliography on Liquefied Natural Gas (LNG) safety [NASA-TM-X-73408] 13 p0127 N77-15208

Performance correlations of five solar collectors tested simultaneously outdoors [NASA-TM-X-73546] 13 p0128 N77-15487

Velocity and temperature distributions of coal-slag layers on magnetohydrodynamic generators walls [NASA-TM-D-8396] 14 p0207 N77-16445

Solar cell collector and method for producing same [NASA-CASE-LEW-12552-1] 14 p0211 N77-17564

Improved backwall cell [NASA-CASE-LEW-12236-1] 14 p0211 N77-17565

Estimates of optimal generating conditions for hydrogen-oxygen cesium-seeded magneto-hydrodynamic power generator [NASA-TM-D-8374] 14 p0213 N77-17852

Results of baseline tests of the Lucas Limousine [NASA-TM-X-73609] 14 p0214 N77-17947

In-situ laser retorting of oil shale [NASA-CASE-LEW-12217-1] 14 p0214 N77-18429

Synchronization of the ERDA-NASA 100 LkW wind turbine generator with large utility networks [NASA-TM-X-73613] 14 p0220 N77-19580

Summer performance results obtained from simultaneously testing ten solar collectors outdoors [NASA-TM-X-73594] 14 p0229 N77-20563

Results of baseline tests of the EVA Metro sedan, Citi-car, Jet Industries Electra-van, CDA town car, and Otis P-500 van [NASA-TM-X-73638] 14 p0236 N77-21549

Energy storage possibilities of atomic hydrogen 14 p0245 N77-21643

Photovoltaic system test facility electromagnetic interference measurements [NASA-TM-X-73640] 15 p0343 N77-22608

ERDA/Lewis research center photovoltaic systems test facility [NASA-TM-X-73641] 15 p0343 N77-22609

Method for producing solar energy panels by automation [NASA-CASE-LEW-12541-1] 15 p0344 N77-22615

Oil cooling system for a gas turbine engine [NASA-CASE-LEW-12830-1] 15 p0353 N77-23106

NASA Quiet Clean General Aviation Turbofan (QCGAT) program status [NASA-TM-X-73564] 15 p0353 N77-23109

Emissions and total energy consumption of a multicylinder piston engine running on gasoline and a hydrogen-gasoline mixture [NASA-TM-D-8487] 15 p0353 N77-23114

Ceramic applications in the advanced Stirling automotive engine [NASA-TM-X-73632] 15 p0354 N77-23487

Ceramics for the advanced automotive gas turbine engine: A look at a single shaft design [NASA-TM-X-73651] 15 p0354 N77-23490

Results of closed cycle MHD power generation test with a helium-cesium working fluid [NASA-TM-X-73621] 15 p0357 N77-23936

- Baseline performance of solar collectors for NASA Langley solar building test facility [NASA-TM-X-3505] 15 p0363 N77-24587
- Experimental evaluation of a breadboard heat and product-water removal system for a space-power fuel cell designed with static water removal and evaporative cooling [NASA-TM-D-8485] 15 p0363 N77-24592
- Method for fabricating solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 15 p0363 N77-24593
- Thermal stability of some aircraft turbine fuels derived from oil shale and coal [NASA-TM-X-3551] 15 p0370 N77-25345
- Solar array maximum power tracking with closed-loop control of a 30-centimeter ion thruster [NASA-TM-X-73643] 15 p0376 N77-26222
- Vibration characteristics of a large wind turbine tower on non-rigid foundations [NASA-TM-X-73670] 15 p0378 N77-26613
- Evaluation of initial collector field performance at the Langley Solar Building Test Facility [NASA-TM-X-73677] 15 p0378 N77-26617
- Sensitivity of solar-cell performance to atmospheric variables. 1: Single cell [NASA-CP-2010] 15 p0378 N77-26623
- Sensitivity of solar-cell performance to atmospheric variables. 2: Dissimilar cells at several locations [NASA-CP-2010] 15 p0379 N77-26624
- Photovoltaic-powered refrigerator experiment at Isle Royale National Park [NASA-TM-73703] 15 p0390 N77-27497
- Analysis of regenerated single-shaft ceramic gas-turbine engines and resulting fuel economy in a compact car [NASA-TM-X-3531] 16 p0521 N77-29607
- Recent developments in photovoltaic energy by ERDA/NASA-LeRC 16 p0526 N77-30277
- Statistics of the radiated field of a space-to-earth microwave power transfer system [NASA-TM-X-73684] 16 p0526 N77-30314
- Consideration of design and calibration of terrestrial reference solar cells 16 p0527 N77-30531
- Sensitivity of solar cell performance to atmospheric variables. 1: Single cell 16 p0527 N77-30534
- Evaluation of phase 2 conceptual designs and implementation assessment resulting from the Energy Conversion Alternatives Study (ECAS) [NASA-TM-73515] 16 p0527 N77-30598
- Dynamic blade loading in the ERDA/NASA 100 kW and 200 kW wind turbines [NASA-TM-73711] 16 p0528 N77-30599
- Drive train normal modes analysis for the ERDA/NASA 100-kilowatt wind turbine generator [NASA-TM-73718] 16 p0529 N77-30611
- Solar cell shingle [NASA-CASE-LEW-12587-1] 16 p0534 N77-31601
- NASA thermionic-conversion program [NASA-TM-X-73644] 16 p0535 N77-31612
- Investigation of excitation control for wind-turbine generator stability [NASA-TM-73745] 16 p0535 N77-31614
- Magnetic heat pumping [NASA-CASE-LEW-12508-2] 16 p0543 N77-32435
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.
- Photovoltaic and thermal energy conversion for solar powered satellites [IAF PAPER 76-117] 13 p0003 A77-10913
- SEP solar array technology development 13 p0040 A77-12825
- Potential structural material problems in a hydrogen energy system 15 p0281 A77-33389
- SEP full-scale wing technology development 16 p0463 A77-48860
- Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere 16 p0464 A77-48875
- An analytical and experimental evaluation of the plano-cylindrical Fresnel lens solar concentrator 16 p0473 A77-48952
- Mechanical thermal motor [NASA-CASE-MFS-23062-1] 13 p0104 N77-12402
- Satellite power system: Engineering and economic analysis summary [NASA-TM-X-73344] 13 p0128 N77-15486
- A performance evaluation of various coatings, substrate materials, and solar collector systems [NASA-TM-X-73355] 13 p0128 N77-15489
- Corrosion inhibitors for solar heating and cooling systems [NASA-TM-D-8409] 14 p0210 N77-17198
- Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking [NASA-CASE-MFS-23267-1] 14 p0228 N77-20401
- Solar absorption characteristics of several coatings and surface finishes [NASA-TM-X-3509] 14 p0229 N77-20567
- Operations research investigations of satellite power stations [NASA-TM-X-73372] 14 p0236 N77-21547
- Proceedings of the ASPE/MSFC Symposium on Engineering and Productivity Gains from Space Technology [NASA-CP-2019] 16 p0525 N77-30273
- ERDA/NASA-MSFC solar heating and cooling development and demonstration program 16 p0525 N77-30274
- Processing on high efficiency solar collector coatings 16 p0526 N77-30286
- Use of heat pipes in electronic hardware 16 p0526 N77-30293
- Space power technology applied to the energy problem 16 p0526 N77-30294
- Horizontally mounted solar collector [NASA-CASE-MFS-23349-1] 16 p0529 N77-30613
- An analytical and experimental investigation of a 1.8 by 3.7 meter Fresnel lens solar concentrator [NASA-TP-1005] 16 p0529 N77-30617
- Aluminum or copper substrate panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-1] 16 p0535 N77-31610
- Stainless steel panel for selective absorption of solar energy and the method of producing said panel [NASA-CASE-MFS-23518-2] 16 p0535 N77-31611
- Introduction: Man and his total environment 16 p0544 N77-32554
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. PASADENA OFFICE, CALIF.
- Hydrogen-rich gas generator [NASA-CASE-NPO-13560-1] 13 p0086 N77-10636
- A non-tracking solar energy collector system [NASA-CASE-NPO-13813-1] 14 p0220 N77-19579
- Solar energy collection system [NASA-CASE-NPO-13579-2] 14 p0229 N77-20565
- Low cost solar energy collection system [NASA-CASE-NPO-13579-3] 14 p0229 N77-20566
- Phase conjugation method and apparatus for an active retrodirective antenna array [NASA-CASE-NPO-13641-1] 15 p0360 N77-24340
- Sun tracking solar energy collector [NASA-CASE-NPO-13921-1] 15 p0363 N77-24590
- A non-tracking solar energy collector system [NASA-CASE-NPO-13817-1] 16 p0513 N77-28583
- Solar pond [NASA-CASE-NPO-13581-2] 16 p0513 N77-28584
- Lightweight reflector assembly [NASA-CASE-NPO-13707-1] 16 p0518 N77-28933
- Oil and fat absorbing polymers [NASA-CASE-NPO-11609-2] 16 p0532 N77-31308
- Solar photolysis of water [NASA-CASE-NPO-13675-1] 16 p0544 N77-32580
- Low to high temperature energy conversion system [NASA-CASE-NPO-13510-1] 16 p0545 N77-32581
- Solar energy collection system [NASA-CASE-NPO-13810-1] 16 p0545 N77-32582
- Three-dimensional tracking solar energy concentrator and method for making same [NASA-CASE-NPO-13736-1] 16 p0545 N77-32583



- NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.**  
Helium research in support of superconducting power transmission  
[PB-265C76/0] 15 p0390 N77-27326
- NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.**  
Analysis of solar energy system for the GSA demonstration office building at Manchester, New Hampshire  
[PB-254179/5] 13 p0091 N77-10687
- The electron factor in catalysis on metals electrocatalysis on non-metallic surfaces  
[PB-256264/3] 13 p0103 N77-12166
- Ship steel weldments for low temperature service  
[PB-256997/8] 13 p0103 N77-12203
- The structure of building specifications  
[PB-257581/9] 13 p0132 N77-15524
- Intermediate minimum property standards for solar heating and domestic hot water systems  
[PB-257086/9] 13 p0132 N77-15525
- Integrating community utilities for resource conservation  
[PB-256898/8] 13 p0133 N77-15923
- Thermal data requirements and performance evaluation procedures for the national solar heating and cooling demonstration program  
[PB-257770/8] 14 p0208 N77-16452
- A survey of state legislation relating to solar energy  
[PB-258235/1] 14 p0213 N77-17600
- Interim performance criteria for solar heating and cooling systems in commercial buildings  
[PB-262114/2] 15 p0348 N77-22669
- Energy management guide for light industry and commerce. EPIC energy management series  
[PB-263121/6] 15 p0356 N77-23616
- Prevention of Failures in Coal Conversion Systems: Proceedings of the 24th Meeting of the Mechanical Failures Prevention Group  
[PB-265552/0] 15 p0395 N77-27563
- Dimensions. Volume 61, number 3  
[PB-266997/6] 16 p0531 N77-31019
- Comparison of computer-predicted and observed energy uses in a multi-family high-rise apartment building  
[PB-267829/0] 16 p0539 N77-31665
- Dimensions, volume 61, no. 5  
[PB-267321/8] 16 p0542 N77-32027
- Technical guidelines for energy conservation  
[AD-A041668] 16 p0546 N77-32596
- Estimation of net enthalpies of combustion of some aviation fuels expressed in the international system of units (SI)  
[NBS-TN-937] 16 p0550 N77-33370
- An approach for managing an energy conservation program  
[AD-A041086] 16 p0554 N77-33614
- Transpiration heat transfer in thermal energy storage devices  
[PB-267281/4] 16 p0554 N77-33616
- Window design strategies to conserve energy  
[PB-269297/8] 16 p0559 N77-33669
- Building energy conservation programs: A preliminary examination of regulatory activities at the state level  
[PB-268873/7] 16 p0559 N77-33673
- NATIONAL CONFERENCE OF STATE LEGISLATURES, DENVER, COLO.**  
State policies for geothermal development. Uncovering a major resource  
[PB-261744/7] 14 p0252 N77-21728
- NATIONAL CONFERENCE OF STATE LEGISLATURES, WASHINGTON, D. C.**  
Analysis of state solar energy options  
[PB-254730/5] 13 p0091 N77-10688
- NATIONAL ENERGY INFORMATION CENTER, WASHINGTON, D. C.**  
Energy interrelationships. A handbook of tables and conversions factors for combining and comparing international energy data  
[PB-269034/5] 16 p0559 N77-33675
- NATIONAL ENFORCEMENT INVESTIGATIONS CENTER, DENVER, COLO.**  
Characterization and evaluation of wastewater sources United States Steel Corporation, Clairton Works, Pittsburgh, Pennsylvania, 28-31 January 1976  
[PB-255586/0] 13 p0116 N77-13566
- NATIONAL FIELD INVESTIGATIONS CENTER, DENVER, COLO.**  
An application of ERTS technology to the evaluation of coal strip mining and reclamation in the northern Great Plains  
[NASA-CR-149208] 13 p0104 N77-12486
- NATIONAL HIGHWAY INST., WASHINGTON, D. C.**  
Conference report: Energy Conservation in Transportation and Construction  
[PB-255857/5] 13 p0100 N77-11562
- NATIONAL MATERIALS ADVISORY BOARD, WASHINGTON, D. C.**  
A screening for potentially critical materials for the National stockpile  
[PB-267214/5] 16 p0533 N77-31595
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, BOULDER, COLO.**  
Solar radiation atmospheric transmission research, phase 1  
[PB-266010/8] 16 p0518 N77-28689
- NATIONAL RESEARCH COUNCIL OF CANADA, OTTAWA (ONTARIO).**  
Energy equivalents for current and prospective automotive fuels in Canada  
[AD-A026195] 13 p0124 N77-14609
- Production of a hydrocarbon-type synthetic fuel from wood  
[NRC-15638] 13 p0127 N77-15210
- NATIONAL RESEARCH INST. FOR MACHINE DESIGN, BRNOVICE (CZECHOSLOVAKIA).**  
Heat pipes for the temperature range from 200 to 600 C  
13 p0119 N77-14381
- Heat pipes with a non-condensable gas and their application in nuclear apparatus and instruments  
13 p0120 N77-14387
- NATIONAL SCIENCE FOUNDATION, WASHINGTON, D. C.**  
Geothermal energy program, current research projects supported by the national science foundation  
[PB-258948/9] 14 p0218 N77-18597
- NATO COMMITTEE ON THE CHALLENGES OF MODERN SOCIETY, BRUSSELS (BELGIUM).**  
Design, construction, and testing of a residential solar heating and cooling system  
[COO-2577-10] 14 p0248 N77-21670
- NATURAL RESOURCES DEFENSE COUNCIL, INC., PALO ALTO, CALIF.**  
Choosing an electrical energy future for the Pacific northwest: An alternative scenario  
[PB-264048/0] 15 p0375 N77-25674
- NAVAL ACADEMY, ANNAPOLIS, MD.**  
Feasibility of heating domestic hot water for apartments with solar energy  
[AD-A028418] 14 p0209 N77-16461
- Design development of advanced composite flywheels  
[AD-A030712] 14 p0214 N77-18230
- NAVAL AIR DEVELOPMENT CENTER, WARRENSTER, PA.**  
Antiwear additives, wear studies on chemical addition agents for imparting an effective lubricating response in polysiloxane (silicone) fluids  
[AD-A033527] 15 p0340 N77-22270
- NAVAL AIR PROPULSION TEST CENTER, TRENTON, N.J.**  
Evaluation of a JP-5 type fuel derived from oil shale  
[AD-A025417] 13 p0112 N77-13231
- Variable cycle engines for V/STOL fighters  
15 p0339 N77-22117
- NAVAL CIVIL ENGINEERING LAB., PORT HUEHENE, CALIF.**  
Experimental polyurethane foam roofing systems  
[AD-A031046] 14 p0210 N77-17255
- The biodegradation of oil in sea water for naval pollution control  
[AD-A042375] 16 p0560 N77-33688
- NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF.**  
Hydraulic ram effect on composite fuel cell entry walls  
[AD-A024832] 13 p0115 N77-13548
- A study of the failure of joints in composite material fuel cells due to hydraulic ram loading  
[AD-A027258] 13 p0117 N77-14016
- Solid state applications of direct energy conversion and heat pumping for a small automotive vehicle  
[AD-A026321] 13 p0124 N77-14607
- An optimization study of a low thermal potential power system  
[AD-A031709] 15 p0348 N77-22666

## NAVAL RESEARCH LAB., WASHINGTON, D. C.

- Electrostatic properties of JP-5 jet fuel from alternate sources  
[AD-A025684] 13 p0103 N77-12232
- Ignition of flammable gases in crude-oil tankers as a result of metal fracture  
[AD-A027411] 13 p0127 N77-15121
- Navy applications for terrestrial photovoltaic solar power  
[AD-A030529] 14 p0218 N77-18590
- Geophysical fluid dynamics background for ocean thermal power plants  
[DSE/1005-1] 16 p0555 N77-33624
- NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, ANNAPOLIS, MD.

- Aluminum-based anodes for underwater fuel cells: A phase report  
[AD-A026405] 13 p0131 N77-15512
- An evaluation of methanol, ethanol, the propanols, and the butanols as ship propulsion fuels  
[AD-A033483] 15 p0354 N77-23277
- NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, BETHESDA, MD.

- Hydrodynamic equilibrium conditions for AG(BB) main strut-pod foil system using flap incidence control  
[AD-A027521] 13 p0127 N77-15220
- NEVADA LEGISLATIVE COUNSEL BUREAU, CARSON CITY. Study of electric and gas utilities and the public service commission of Nevada  
[PB-268481/9] 16 p0547 N77-32605
- NEW MEXICO STATE BUREAU OF MINES AND MINERAL RESOURCES, SOCORRO. Analysis of LANDSAT B imagery as a tool for evaluating, developing, and managing the natural resources of New Mexico  
[E77-10090] 14 p0214 N77-18511
- NEW MEXICO UNIV., ALBUQUERQUE.

- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
15 p0279 A77-33374
- Investigation of counterflow shear effects in heat pipes  
[AIAA PAPER 77-749] 15 p0311 A77-37262
- Investigation of performance limits in axial groove heat pipes  
[NASA-CR-137912] 13 p0095 N77-11340
- Analysis of a heat pipe exchanger  
13 p0112 N77-13355
- Hydrogen Energy: A bibliography with abstracts. Fourth quarter 1976  
[NASA-CR-149864] 14 p0220 N77-19577
- Hydrogen Energy: A bibliography with abstracts. Third quarter 1976  
[NASA-CR-149863] 14 p0220 N77-19578
- Thermodynamic analysis of alternate energy carriers, hydrogen and chemical heat pipes  
14 p0240 N77-21608
- Solar energy: Policy and prospects  
[PB-267986/8] 16 p0554 N77-33620

- NEW SOUTH WALES UNIV., KENSINGTON (AUSTRALIA). Cryogenic instrumentation needs in the controlled thermonuclear research program  
[CONF-761007-1] 14 p0219 N77-19406
- NEW YORK STATE ASSEMBLY SCIENTIFIC STAFF, ALBANY. Solar energy applications and related legislation  
[PB-267901/7] 16 p0539 N77-31666
- NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER, RESEARCH TRIANGLE PARK. Solar assisted heat pumps: A possible wave of the future  
[NASA-CR-2771] 13 p0121 N77-14584
- NORTH CAROLINA STATE UNIV., RALPHIGH. Performance limitations of silicon solar cells  
15 p0257 A77-30711
- Best-range flight conditions for cruise-climb flight of a jet aircraft  
13 p0085 N77-10379
- Research on solar energy storage subsystems utilizing the latent heat of phase change of paraffin hydrocarbons for the heating and cooling of buildings  
[PB-254665/3] 13 p0091 N77-10689
- Conference proceedings, Energy from the Oceans, Fact or Fantasy  
[PB-256093/6] 13 p0108 N77-12547

- An economic and performance design study of solar preheaters for domestic hot water heaters in North Carolina  
[NASA-CR-2813] 14 p0228 N77-20559
- NORTH CAROLINA UNIV., CHAPEL HILL. Fuel cells and solid electrolytes  
[AD-A033782] 15 p0366 N77-24630
- NORTHWESTERN TECHNOLOGICAL INST., EVANSTON, ILL. Heat extraction from hot, dry rock masses  
[PB-265116/4] 16 p0516 N77-28609
- NORTHWESTERN UNIV., EVANSTON, ILL. Heat extraction from hot dry rock masses  
[PB-256775/8] 13 p0116 N77-13556
- Interfacial effects in the recovery of residual oil by displacement: Studies at Northwestern University  
[COO-0019-5] 13 p0122 N77-14595
- Stochastic modelling of site wind characteristics  
[PB-261178/8] 15 p0351 N77-22775
- Basic research on ceramic materials for energy storage and conversion systems  
[COO-2564-2] 16 p0511 N77-28305
- NOTRE DAME UNIV., IND. Contamination of groundwater by heavy metals from the land disposal of fly ash  
[COO-2727-4] 15 p0357 N77-23631
- NUCLEAR REGULATORY COMMISSION, WASHINGTON, D. C. Occupational radiation exposure at light water cooled power reactors, 1969-1975  
[PB-257054/7] 13 p0125 N77-14740
- Environmental survey of the reprocessing and waste management portions of the LWR fuel cycle: A task force report  
[PB-258316/9] 14 p0209 N77-16879
- Improving regulatory effectiveness in Federal/State siting actions. Alternative financing methods  
[PB-269390/1] 16 p0547 N77-32606
- BUS CORP., ROCKVILLE, MD. Availability of potential coal supply through 1985 by quality characteristics  
[PB-256680/0] 13 p0121 N77-14573

## 0

## OAK RIDGE ASSOCIATED UNIVERSITIES, TENN.

- Net energy from nuclear power  
[PB-254059/9] 13 p0107 N77-12527
- OAK RIDGE NATIONAL LAB., TENN. Transportation energy conservation data book  
[ORNL-5198] 13 p0086 N77-10643
- Waste heat vs conventional systems for greenhouse environmental control: An economic assessment  
[ORNL-TN-5069] 13 p0088 N77-10656
- Inventory of energy research and development (1973 - 1975), volume 1  
[GPO-64-734-VOL-1] 13 p0113 N77-13525
- Inventory of energy research and development (1973 - 1975), volume 2  
[GPO-64-734-VOL-2] 13 p0113 N77-13526
- Inventory of energy research and development (1973 - 1975), volume 3  
[GPO-64-734-VOL-3] 13 p0113 N77-13527
- Inventory of energy research and development (1973 - 1975), volume 4  
[GPO-64-734-VOL-4] 13 p0113 N77-13528
- Inventory of energy research and development (1973 - 1975), volume 5  
[GPO-64-734] 13 p0121 N77-14579
- Potential for energy conservation technology transfer  
[CONF-760536-1] 14 p0211 N77-17573
- Balanced program plan. Volume 4: Coal conversion  
[ORNL-5123-VOL-4] 14 p0216 N77-18566
- Coal technology program  
[ORNL-5159] 14 p0216 N77-18568
- Development of the ice-maker heat pump  
[CONF-760618-2] 14 p0223 N77-19624
- Residential energy use alternatives to the year 2000  
[CONF-760648-1] 14 p0223 N77-19625
- Recovery of inaccessible coal reserves by in situ gasification  
[CONF-760906-5] 14 p0224 N77-19636
- Practical reasons for investigating ion transport in high temperature insulating materials  
[CONF-760831-2] 14 p0227 N77-19935

- Engineering-economic model of residential energy use  
[ORNL-TM-5470] 14 p0231 N77-20580
- Precipitation and scaling in dynamic geothermal systems  
[ORNL-TM-5649] 14 p0249 N77-21680
- HIUS systems analysis: Initial comparisons of modular-sized integrated utility systems and conventional systems  
[ORNL-HUE-HIUS-6] 14 p0249 N77-21684
- Cryogenic power transmission technology: Cryogenic dielectrics  
[ORNL-TM-5498] 15 p0341 N77-22297
- Thermal energy storage for building heating and cooling applications  
[ORNL-TM-5700] 15 p0344 N77-22617
- Impact of alternate fuels on industrial refractories and refractory insulation applications: An assessment  
[ORNL-TM-5592] 15 p0344 N77-22618
- Development and applications of spatial data resources in energy related assessment and planning  
[CONP-761017-1] 15 p0355 N77-23609
- Corrosivity of geothermal brines  
[ORNL-TM-5688] 15 p0359 N77-24265
- Process energy reliability requirements for selected industries  
[ORNL-TM-5428] 15 p0364 N77-24594
- Electrostatic energy storage  
[ORNL-TM-5529] 15 p0364 N77-24598
- Annual cycle energy system: Initial investigations  
[ORNL-TM-5525] 15 p0364 N77-24599
- Application of the ice-maker heat pump to an annual cycle energy system  
[CONP-761107-13] 15 p0382 N77-26659
- Comparison of calculated and measured maximum aboveground air pollutant concentrations and their respective distances from the source of release of large power plants  
[ORNL-TM-4231] 15 p0386 N77-26712
- Internalizing social costs in power plant siting: Some examples for coal and nuclear plants in the United States  
[CONP-761103-16] 15 p0386 N77-26816
- Cryogenic power transmission technology: Cryogenic dielectrics  
[ORNL-TM-5608] 15 p0389 N77-27249
- Survey of technology for storage of thermal energy in heat transfer salt  
[ORNL-TM-5682] 15 p0392 N77-27513
- Coal conversion: Description of technologies and necessary biomedical and environmental research  
[ORNL-5192] 15 p0392 N77-27520
- Savings in energy consumption by residential heat pumps: the effects of lower indoor temperatures and of night setback  
[ORNL-COM-4] 16 p0529 N77-30628
- Approaches to chemical class analyses of fossil derived materials  
[CONP-770301-5] 16 p0532 N77-31271
- Low-temperature thermal energy storage  
[ORNL-TM-5795] 16 p0536 N77-31631
- Summary report: An exploratory study of cost targets for solar electric power plants  
[ORNL-TM-5787] 16 p0538 N77-31654
- Transportation Energy Conservation Data Book, supplement 2  
[ORNL-5247-SUPPL-2] 16 p0542 N77-32036
- Improved engineering-economic model of residential energy use  
[ORNL-COM-8] 16 p0557 N77-33644
- Technical and economic studies of small reactors for supply of electricity and steam  
[IAEA-CN-36/398] 16 p0560 N77-33678
- Survey of nuclear fuel cycle economics: 1970 - 1985  
[ORNL-TM-5703] 16 p0561 N77-33968
- OAK RIDGE Y-12 PLANT, TENN.  
Composite flywheel development  
[Y-2072] 15 p0388 N77-27194
- OCEANIC INST., WAIMANALO, HAWAII.  
Hydrogen in the seaward advancement of industrial societies  
14 p0246 N77-21656
- OFFICE OF NAVAL RESEARCH, LONDON (ENGLAND).  
Energy and Physics: General Conference of the European Physical Society  
[AD-A026962] 13 p0131 N77-15511
- The 10th International Power Sources Symposium  
[AD-A033323] 15 p0347 N77-22656
- International Symposium on Wind Energy Systems  
[AD-A034871] 15 p0366 N77-24627
- International Conference on Hydrogen and its Prospects  
[AD-A036936] 15 p0385 N77-26696
- OHIO DEPT. OF ECONOMIC AND COMMUNITY DEVELOPMENT, COLUMBUS.  
Development of a multi-disciplinary ERTS user program in the state of Ohio  
[E77-10045] 13 p0104 N77-12475
- OHIO STATE UNIV. RESEARCH FOUNDATION, COLUMBUS.  
Semiconductor-electrolyte photovoltaic energy converter  
[PB-252837/0] 13 p0099 N77-11548
- A framework for assessing environmental impacts of possible Antarctic mineral development, part 1  
[PB-262750/3] 15 p0368 N77-24709
- OKLAHOMA STATE UNIV., STILLWATER.  
Performance characteristics of a high-pressure, moderate temperature, electrolysis system  
14 p0238 N77-21595
- A wind energy system utilizing high pressure electrolysis as a storage mechanism  
14 p0240 N77-21610
- Development and adaptation of field modulated generator systems for wind energy applications  
[PB-263604/1] 15 p0357 N77-23625
- OKLAHOMA UNIV., NORMAN.  
Resource utilization efficiency improvement of geothermal binary cycles, phase 1  
[ORO-4944-3] 13 p0123 N77-14600
- Economic evaluation of mixture and pure fluid cycles in ocean thermal energy conversion systems  
[ORO-4918-8] 14 p0217 N77-18578
- Our energy future: The role of research, development, and demonstration in reaching a national consensus on energy supply  
[PB-263761/9] 15 p0367 N77-24635
- OLD DOMINION UNIV., NORFOLK, VA.  
A comparison of GaAs and Si hybrid solar power systems  
16 p0406 N77-41584
- NASA Office of Aeronautics and Space Technology Summer Workshop. Volume 4: Power technology panel  
[NASA-TM-X-73964] 13 p0117 N77-13913
- OLD DOMINION UNIV. RESEARCH FOUNDATION, NORFOLK, VA.  
Analysis of GaAs and Si solar energy hybrid systems  
[NASA-CR-2800] 14 p0229 N77-20564
- OLSON LABS., INC., ANAHEIM, CALIF.  
Effect of automotive parts on vehicle and engine emissions. Phase 1: Original equipment  
[PB-264057/1] 15 p0368 N77-24672
- OPTICAL COATING LAB., INC., CITY OF INDUSTRY, CALIF.  
Research, development and pilot production of high output thin silicon solar cells  
[NASA-CR-149858] 14 p0219 N77-19573
- ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, PARIS (FRANCE)  
World energy supply and demand and the future of nuclear power  
[IAEA-CN-36/583] 16 p0560 N77-33680
- OWENS-ILLINOIS, INC., TOLEDO, OHIO.  
Evaluation of an all-glass, evacuated, tubular, non-focusing, non-tracking solar collector array  
[TID-27192] 15 p0364 N77-24600
- OXFORD UNIV. (ENGLAND).  
Metalhydrides  
[OUEL-1146/76] 13 p0094 N77-11158

## P

- PACIFIC ENVIRONMENTAL SERVICES, INC., SANTA MONICA, CALIF.  
Study of gasoline vapor emission controls at small bulk plants  
[PB-267096/6] 16 p0549 N77-32638
- Reliability study of vapor recovery systems at service stations  
[PB-267613/8] 16 p0560 N77-33700

- PAPANICOLAOU CANCER RESEARCH INST., RIVERSIDE, CALIF.  
Operation cough drop 14 p0247 N77-21665
- PARAGON PACIFIC, INC., EL SEGUNDO, CALIF.  
Coupled dynamics analysis of wind energy systems [NASA-CR-135152] 14 p0228 N77-20558
- PARSONS (RALPH M.) CO., PASADENA, CALIF.  
Preliminary design services coal conservation demonstration plants [FE-1775-3] 13 p0130 N77-15502
- PARSONS (RALPH M.) CO., WASHINGTON, D. C.  
Energy use in the contract construction industry. Appendix E: Assessment of construction equipment availability, energy requirements, and construction industry capacity to support Project Independence [PB-245424/7] 13 p0100 N77-11559
- PEAT, HARWICK, MITCHELL AND CO., ANCHORAGE, ALASKA.  
Alaska OCS socioeconomic studies program, literature survey [PB-269244/0] 16 p0549 N77-32681
- PEAT, HARWICK, LIVINGSTON AND CO., WASHINGTON, D. C.  
Macro-economic impact and other considerations in selecting energy conservation measures [PB-257678/3] 14 p0208 N77-16454
- PENNSYLVANIA DEPT. OF COMMUNITY AFFAIRS, HARRISBURG.  
Reclamation of energy from solid waste: Theory and practice. A selected, annotated bibliography for Pennsylvania local government officials [PB-267800/1] 16 p0555 N77-33621
- PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.  
Underground coal mining: An assessment of technology [PB-255726/2] 13 p0093 N77-10974
- Problems and solutions in the use of coal analyses [FE-0390-1] 13 p0097 N77-11535
- Interpretation of Pennsylvania agricultural land use from ERTS-1 data [E77-10111] 14 p0215 N77-18525
- Experimental results for a heat pump system with thermal storage [COO-2704-3] 14 p0250 N77-21697
- Preliminary study of the importance of hydrothermal reactions on the temperature history of a hot, dry rock geothermal reservoir [PB-262391/6] 14 p0252 N77-21731
- Historical trends in coal utilization and supply [PB-261278/6] 15 p0341 N77-22295
- PENNSYLVANIA UNIV., PHILADELPHIA.  
Trade-off analyses for multi-objective transportation plans 13 p0102 N77-11911
- Planning models for the assessment of advanced energy storage systems 13 p0105 N77-12504
- Impact of a suburban rapid transit line of fuel consumption and cost for the journey-to-work. Analysis of the Philadelphia-Lindenwood high-speed line [PB-263048/1] 15 p0370 N77-25014
- Research and development of low cost processes for integrated solar arrays [COO-2721-76-1] 15 p0383 N77-26670
- Regional economic impacts of nuclear power plants [BNL-50562] 16 p0540 N77-31676
- PERCEPTRONICS, INC., WOODLAND HILLS, CALIF.  
Development of signal processing algorithms for ultrasonic detection of coal seam interfaces [NASA-CR-150024] 13 p0085 N77-10610
- PERKIN-ELMER CORP., DANBURY, CONN.  
Extended cryogenic performance of Lobar Wick heat pipe/radiator 13 p0119 N77-14379
- PISA UNIV. (ITALY).  
Performance characteristics of turbo-rockets and turbo-ramjets using high energy fuel 15 p0339 N77-22131
- PITTSBURGH UNIV., PA.  
Multi-year time frame optimization of power systems with fossil, nuclear, hydro, pumped storage and peaking units 13 p0096 N77-11525
- POLYTECHNIC INST. OF NEW YORK, BROOKLYN.  
Heat-pipe bismuth laser; examination of laser action at 4722 Å in bismuth vapor [AD-A039568] 16 p0533 N77-31495
- POPE, EVANS, AND ROBBINS, INC., NEW YORK.  
Site energy handbook. Volume 1: Methodology for energy survey and appraisal [ERDA-76-131/1] 15 p0355 N77-23607
- PRATT AND WHITNEY AIRCRAFT, EAST HARTFORD, CONN.  
Air transport propulsion for the 1980's 13 p0117 N77-13980
- PRATT (R. H.) ASSOCIATES, INC., KENSINGTON, MD.  
The potential for transit as an energy saving option [PB-263087/9] 15 p0359 N77-24019
- PRC SYSTEMS SCIENCES CO., LOS ANGELES, CALIF.  
Survey of satellite power stations [DSE/2071-1] 16 p0532 N77-31225
- PRINCETON UNIV., N. J.  
Mass driver retrievals of earth-approaching asteroids [AIAA PAPER 77-528] 15 p0265 A77-J2053
- Mining the Apollo and Amor asteroids 16 p0400 A77-40648
- Hydrogen atoms: Rare earth ions: Magnetic resonance studies on polycrystalline solids and surface systems relevant to catalysis and other energy-related research 13 p0117 N77-13798
- Optimization and characteristics of a sailing windmill rotor [PB-259898/5] 14 p0234 N77-20622
- Synthetic fuels from solid wastes and solar energy 14 p0237 N77-21565
- Optimization of fusion-driven fissioning systems [PPPL-1285] 15 p0342 N77-22469
- Tokamak hybrid study [PPPL-1284] 15 p0358 N77-23942
- Chemical engineering side of nuclear fusion power [PPPL-1303] 15 p0376 N77-25965
- Optimization and characteristics of a sailing windmill rotor [NSF/RANN/GI-41891/FR/75/4] 16 p0558 N77-33652
- PUBLIC SERVICE ELECTRIC AND GAS CO., NEWARK, N. J.  
Economic assessment of the utilization of fuel cells in electric utility [EPRI-EM-336] 15 p0392 N77-27516
- Assessment of energy storage systems suitable for use by electric utilities, volume 3 [EPRI-EM-264-VOL-3] 16 p0537 N77-31636
- PURDUE UNIV., LAFAYETTE, IND.  
Applications of a doubly-fed induction machine in a large flywheel energy storage system 16 p0520 N77-29602

## Q

- QEI, INC., BEDFORD, MASS.  
Factors in the planning of a national information system for renewable energy [PB-262003/7] 15 p0358 N77-24002

## R

- RADIAN CORP., AUSTIN, TEX.  
Sampling strategy and characterization of Potential Emissions from Synfuel Production Symposium [CONF-760602] 16 p0515 N77-28603
- In-situ coal gasification: Status of technology and environment impact [PB-268576/6] 16 p0548 N77-32613
- RAINES (JEREMY K.), BETHESDA, MD.  
Theoretical analysis of the EREC report [NASA-CR-152542] 15 p0390 N77-27493
- RAND CORP., SANTA MONICA, CALIF.  
The long-run marginal costs of energy [PB-252504/6] 13 p0085 N77-10625
- A simulation analysis of US energy demand, supply, and prices [PB-254314/8] 13 p0090 N77-10680
- Some cost, energy, environmental, and resource implications of synthetic fuels produced from coal for military aircraft [AD-A026667] 13 p0118 N77-14271
- Possible effects of nuclear initiative on supply and use of electricity in California [AD-A026582] 13 p0131 N77-15510
- California's energy future [AD-A032221] 15 p0348 N77-22667

- The potential role of technological modifications and alternative fuels in alleviating Air Force energy problems  
[AD-A039597] 16 p0525 N77-30261
- An evaluation of very large airplanes and alternative fuels  
[AD-A040532] 16 p0532 N77-31334
- An evaluation of very large airplanes and alternative fuels: Executive summary  
[AD-A042112] 16 p0550 N77-33154
- Europe's changing energy relations  
[R-2086-ISA] 16 p0553 N77-33610
- RAND CORP., WASHINGTON, D. C.  
The potential of liquid hydrogen as a military aircraft fuel  
[AD-A026666] 13 p0118 N77-14272
- RASOR ASSOCIATES, INC., SUNNYVALE, CALIF.  
Thermionic topping for central station power plants  
13 p0034 A77-12787
- Thermoelectronic laser energy conversion for power transmission in space  
16 p0464 A77-48876
- Status of research on advanced thermionic converters  
16 p0466 A77-48889
- RAYTHEON CO., WAYLAND, MASS.  
Space-borne power conversion into a microwave beam and its impact on the environment of the upper atmosphere  
16 p0464 A77-48875
- RCA ADVANCED TECHNOLOGY LABS., CAMDEN, N. J.  
Design definition of a mechanical capacitor  
[NASA-CR-152613] 16 p0552 N77-33603
- RCA LABS., PRINCETON, N. J.  
Epitaxial silicon technology for low-cost solar cells  
[PB-262356/5] 15 p0374 N77-25663
- RENSSELAER POLYTECHNIC INST., TROY, N. Y.  
Electric energy supply alternatives for New York. Phase 2: An appraisal of electrical energy alternatives available to the State of New York  
[PB-249881/4] 13 p0101 N77-11575
- An analysis of the feasibility of windmills for power generation in New York State  
[RPI-TA-17] 15 p0380 N77-26638
- RESEARCH CORP. OF NEW ENGLAND, WETHERSFIELD, CONN.  
Development of procedures for the measurement of fugitive emissions  
[PB-263992/0] 15 p0368 N77-24671
- RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.  
Second Environmental Aspects of Fuel Conversion Technology Symposium  
[PB-257162/6] 13 p0125 N77-14645
- Technology and economics of flue gas NOx oxidation by ozone  
[PB-261917/9] 15 p0350 N77-22700
- RANN utilization experience (case studies 32 through 41)  
[PB-263683/5] 15 p0370/ N77-25027
- RESOURCE PLANNING ASSOCIATES, INC., CAMBRIDGE, MASS.  
Identification and analysis of mid-Atlantic onshore OCS impact  
[PB-254925/1] 13 p0096 N77-11516
- The exploration, development and production of Naval petroleum reserve number 4  
[PB-256714/7] 13 p0113 N77-13516
- RESOURCES FOR THE FUTURE, INC., WASHINGTON, D. C.  
Workshop to Review FEA's 1976 National energy outlook  
[PB-268149/2] 16 p0547 N77-32601
- REHINISCHE BRAUNKOHLENWERKE A.G., COLOGNE (WEST GERMANY).  
Gasification of coal and its future aspects regarding the use of heat from high-temperature nuclear reactors  
[INIS-MF-1965] 13 p0084 N77-10228
- ROCKETDYNE, CANOGA PARK, CALIF.  
MHD combustor design study  
[TID-27144] 15 p0396 N77-27923
- ROCKWELL INTERNATIONAL CORP., CANOGA PARK, CALIF.  
Development of thermal control methods for specialized components and scientific instruments at very low temperatures (follow-on)  
[NASA-CR-150152] 13 p0127 N77-15347
- ROCKWELL INTERNATIONAL CORP., DOWNEY, CALIF.  
The multistage heat pipe radiator - An advancement in passive cooling technology  
[AIAA PAPER 77-760] 15 p0312 A77-37271
- New options for satellite power systems /SPS/  
[AIAA PAPER 77-1028] 16 p0419 A77-43392
- Economic and technical feasibility study for energy storage flywheels  
[ERDA-76-65] 14 p0249 N77-21685
- Flexible cryogenic heat pipe development program  
[NASA-CR-152027] 16 p0520 N77-29451
- ROCKWELL INTERNATIONAL CORP., THOUSAND OAKS, CALIF.  
Selection of structural materials for hydrogen pipelines and storage vessels  
14 p0243 N77-21625
- ROCKWELL INTERNATIONAL SCIENCE CENTER, THOUSAND OAKS, CALIF.  
Development of an (AlGaAs-Ga As) graded band gap solar cell  
[NASA-CR-145161] 15 p0355 N77-23603
- ROGERS ENGINEERING CO., INC., SAN FRANCISCO, CALIF.  
Modular 5 MW geothermal power plant design considerations and guidelines  
[UCRL-13684] 14 p0222 N77-19612
- ROLLS-ROYCE LTD., BRISTOL (ENGLAND).  
Variable geometry in the gas turbine - the variable pitch fan engine  
15 p0339 N77-22128
- Variable flow turbines  
15 p0340 N77-22142
- ROORKEE UNIV. (INDIA).  
Use of hydrogen in automotive engines  
14 p0244 N77-21639
- ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES, MIAMI, FLA.  
Classification of oils by the application of pattern recognition techniques to infrared spectra  
[AD-A039387] 16 p0531 N77-30841
- ROYAL AIRCRAFT ESTABLISHMENT, FARNBOROUGH (ENGLAND).  
Recommendations for the performance rating of flat plate terrestrial photovoltaic solar panels  
16 p0527 N77-30539
- ROYAL INST. OF TECH., STOCKHOLM (SWEDEN).  
Power loss problems in EXTRAP coil systems  
[TRITA-PPU-77-02] 16 p0549 N77-32910
- RUTGERS - THE STATE UNIV., NEW BRUNSWICK, N. J.  
Silicon Schottky photovoltaic diodes for solar energy conversion  
[PB-263172/9] 15 p0357 N77-23624
- Silicon Schottky photovoltaic diodes for solar energy conversion  
[PB-268457/9] 16 p0547 N77-32604
- S**
- SANDIA CORP., ALBUQUERQUE, N. MEX.  
Branched thermocouple circuits in underground coal gasification experiments  
[SAND-75-5910] 13 p0130 N77-15504
- SANDIA LABS., ALBUQUERQUE, N. MEX.  
Silicon solar photovoltaic power stations  
[AIAA 77-1021] 16 p0404 A77-41563
- Survey of high temperature thermal energy storage  
[SAND-75-8063] 13 p0088 N77-10655
- Solar radiation availability to various collector geometries: A preliminary study  
[SAND-76-0009] 13 p0097 N77-11537
- Synergistic effects of shadowing on a solar collector matrix  
[SAND-76-0012] 13 p0122 N77-14587
- Solar total energy program  
[SAND-76-0205] 14 p0211 N77-17571
- Wind tunnel performance data for the Darrieus wind turbine with NACA 0012 blades  
[SAND-76-0130] 14 p0214 N77-18057
- Economic study of solar total energy  
[SAND-76-5291] 14 p0216 N77-18574
- Status of the ERDA/Sandia 17-metre Darrieus turbine design  
[SAND-76-5683] 14 p0217 N77-18576
- Soft X-ray lasers  
[SAND-76-5542] 14 p0219 N77-19425
- Darrieus Vertical-Axis Wind Turbine program at Sandia Laboratories  
[SAND-76-5712] 14 p0223 N77-19616
- Optical materials for solar energy applications  
[SAND-76-5141] 14 p0224 N77-19628

- Photovoltaic energy conversion using concentrated sunlight  
[SAND-76-5759] 14 p0225 N77-19647
- Sandia vertical-axis wind turbine program  
[SAND-76-0338] 14 p0250 N77-21686
- Vertical-axis wind turbine technology workshop  
[SAND-76-5586] 14 p0250 N77-21688
- Rankine cycle energy conversion system design considerations for low and intermediate temperature sensible heat sources  
[SAND-76-0363] 14 p0251 N77-21699
- Focused solar collector analysis with axially varying input due to shadowing from adjacent collectors  
[SAND-76-5061] 15 p0345 N77-22635
- Magma energy research project, volume 2, no. 2  
[SAND-76-0264-VOL-2-NO-2] 15 p0372 N77-25638
- Silicon solar cell development for concentrated-sunlight, high-temperature applications  
[SAND-76-5311] 15 p0380 N77-26647
- Effects of spectral variations on silicon cell output  
[SAND-76-9142] 15 p0381 N77-26653
- The 275 deg C microcircuitry: Resistors, capacitors, conductors, substrates, and bonding  
[SAND-76-0611] 15 p0389 N77-27312
- Nonbiological photochemical energy conversion, can it compete  
[SAND-76-5763] 15 p0393 N77-27541
- Hydrogen compatibility of structural materials for energy storage and transmission applications  
[SAND-76-8255] 15 p0395 N77-27553
- Total energy systems: Solar energy program  
[SAND-76-5758] 16 p0514 N77-28591
- Application of laminated wooden blades to a two-meter Darrieus type vertical axis wind turbine  
[SAND-75-0284] 16 p0521 N77-29612
- Sandia vertical-axis wind turbine project  
[SAND-76-0581] 16 p0521 N77-29613
- Silicon solar cell testing in concentrated sunlight and simulated sunlight  
16 p0527 N77-30540
- Solar Collection Module Test Facility, instrumentation fluid loop number one  
[SAND-76-0425] 16 p0535 N77-31619
- Natural gas massive hydraulic fracture research and advanced technology project  
[SAND-76-0723] 16 p0536 N77-31630
- Sandia Laboratories energy programs  
[SAND-77-0034] 16 p0555 N77-33629
- Solar radiation availability for New Mexico  
[SAND-77-0004] 16 p0558 N77-33654
- SANDIA LABS., LIVERMORE, CALIF.
- Combustion rates and mechanisms of pulverized coals and coal-derived fuels  
[SAND-76-8229] 14 p0224 N77-19638
- Optical and thermal characteristics of a solar collector with a stationary spherical reflector and a tracking absorber  
[SAND-76-8663] 14 p0248 N77-21674
- Development of the solar power central receiver concept  
[SAND-76-8677] 15 p0344 N77-22624
- Potential of a solar collector with a stationary spherical reflector and a tracking absorber for electrical power production  
[SAND-76-8039] 15 p0345 N77-22636
- Combustion research at Sandia Laboratories  
[SAND-76-8511] 15 p0377 N77-26253
- SCHLESINGER (ROBERT J.), TARZANA, CALIF.
- Hybrid simulation of solar HVAC system for house retro-fit design  
[PB-252618/5] 13 p0090 N77-10676
- SCIENCE APPLICATIONS, INC., MCLEAN, VA.
- Supply of liquefied natural gas to the Northeast  
[BNL-50556] 15 p0392 N77-27521
- SCIENTIFIC TRANSLATION SERVICE, SANTA BARBARA, CALIF.
- Cross structural plan of the earth's crust and the problem of the manifestation of its plutonic elements on the surface (Tyan-Shan and Turan plate as examples)  
[NASA-TT-F-16938] 13 p0117 N77-13590
- Storage of thermal energy in molten salts and metals  
[NASA-TT-F-17412] 14 p0220 N77-19574
- Effect of nitrogenous bases on the thermal stability of jet fuels  
[NASA-TM-75131] 15 p0388 N77-27243
- Solubilization of coal in organic media  
[NASA-TM-75151] 15 p0390 N77-27498
- SCORE, INC., CAMBRIDGE, MASS.
- Energy resources alternatives competition  
[COO-2698-1] 14 p0224 N77-19635
- SELSKAPET FOR INDUSTRIELL OG TEKNISK FORSKNING, TRONDHEIM (NORWAY).
- A finite element model for the analysis of waterflood performance  
[STF71-A75036] 16 p0551 N77-33464
- SENSOR TECHNOLOGY, INC., CHATSWORTH, CALIF.
- Development of low cost, high energy-per-unit-area solar cell modules  
[NASA-CR-153977] 16 p0528 N77-30605
- SERVICIO GEOLOGICO DE BOLIVIA, LA PAZ.
- The 29950 Earth Resource Technology Satellite (ERTS-A) sensor data for mineral resource sector development and regional land use survey, March - August 1976  
[E77-10028] 13 p0096 N77-11491
- SHAKER RESEARCH CORP., BALLSTON LAKE, N. Y.
- Underground coal mine instrumentation and test  
[NASA-CR-150045] 16 p0551 N77-33479
- SHELDON CO., NORTHFIELD, MINN.
- Solar power array for the concentration of energy. Task 2: Modifications to a specular photometer  
[COO-2699-3] 13 p0098 N77-11538
- SHELL OIL CO., HOUSTON, TEX.
- Evaluation of combined in-situ and surface retorting of oil shale tract C-b  
[PB-261064/0] 15 p0347 N77-22646
- SIAM INST. FOR MATHEMATICS AND SOCIETY, PHILADELPHIA, PA.
- Mathematics for energy  
[PB-252463/5] 13 p0098 N77-11543
- SIGMA RESEARCH, INC., RICHLAND, WASH.
- Two-phase working fluids for the temperature range 100-350 C  
[AIAA PAPER 77-753] 15 p0312 A77-37266
- A structured surface for high performance evaporative heat transfer  
[AIAA PAPER 77-778] 15 p0312 A77-37283
- SIMULATION PHYSICS, INC., BEDFORD, MASS.
- Silicon solar cells by high-speed low-temperature processing  
15 p0258 A77-30728
- SIMULATION PHYSICS, INC., BURLINGTON, MASS.
- Low energy production processes in manufacturing of silicon solar cells  
16 p0486 A77-49055
- Silicon thin film crystallization and solar cell fabrication  
[PB-261715/7] 15 p0348 N77-22670
- SKIDMORE, OWINGS AND MERRILL, WASHINGTON, D. C.
- Bonneville power administration electric energy conservation study  
[PB-256766/7] 13 p0115 N77-13550
- SMITHSONIAN ASTROPHYSICAL OBSERVATORY, CAMBRIDGE, MASS.
- Measurements of Sc I gf-values  
13 p0058 A77-16270
- SOCIETAL ANALYTICS INST., INC., DALLAS, TEX.
- Barriers to the use of wind energy machines: The present legal/regulatory regime and a preliminary assessment of some legal/political/societal problems  
[PB-263576/1] 15 p0366 N77-24620
- SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, CANNES (FRANCE).
- Development of space applications of heat pipes at Aerospatiale  
13 p0120 N77-14390
- SOLAREX CORP., ROCKVILLE, MD.
- Development of 20 percent efficient solar cell  
[PB-255903/7] 13 p0108 N77-12548
- Solar breeder: Energy payback time for silicon photovoltaic systems  
[NASA-CR-153060] 15 p0362 N77-24581
- Development of a high efficiency thin silicon solar cell  
[NASA-CR-153905] 15 p0391 N77-27502
- Energy requirement for the production of silicon solar arrays  
[NASA-CR-153409] 16 p0528 N77-30604

- SOUTHAMPTON UNIV. (ENGLAND).**  
Possible pollution and cost analysis from wide use of hydrogen fuel in transportation  
14 p0247 N77-21664
- SOUTHERN CALIFORNIA GAS CO., LOS ANGELES.**  
Technical and environmental aspects of underground hydrogen storage  
14 p0242 N77-21613
- Project SAGE: Solar Assisted Gas Energy Project.** United States special format report [DSE/4691-76/1]  
16 p0522 N77-29614
- SOUTHERN METHODIST UNIV., DALLAS, TEX.**  
Development of low cost thin film polycrystalline silicon solar cells for terrestrial applications  
16 p0517 N77-28618
- SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.**  
Protocol to characterize gaseous emissions as a function of fuel and additive composition  
13 p0084 N77-10221
- A study to obtain verification of liquid Natural Gas (LNG) tank loading criteria**  
13 p0120 N77-14492
- Development of an assessment methodology for geopressured zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in South Texas**  
14 p0215 N77-18564
- Operational, cost, and technical study of large windpower systems integrated with existing electric utility**  
14 p0222 N77-19609
- Performance of Army engines with unleaded gasoline-field study evaluation**  
15 p0342 N77-22490
- Development of an assessment methodology for geopressurized zones of the upper Gulf Coast based on a study of abnormally pressured gas fields in south Texas**  
15 p0361 N77-24571
- Engine performance and fire-safety characteristics of water-containing diesel fuels**  
15 p0377 N77-26330
- SOWLE (DOW) ASSOCIATES, INC., ARLINGTON, VA.**  
A federal procurement plan to accelerate use of solar energy  
15 p0356 N77-23618
- SPECIAL STUDIES GROUP TWO, APPELDOORN (NETHERLANDS).**  
Hydrogen in the energy system of The Netherlands  
14 p0247 N77-21660
- SPECTROLAB, INC., SYLMAR, CALIF.**  
Advanced high efficiency wraparound contact solar cell  
14 p0174 A77-23934
- Low reflectivity solar cells**  
13 p0108 N77-12539
- Demonstration of the feasibility of automated silicon solar cell fabrication**  
13 p0129 N77-15492
- Development of standardized specifications for silicon solar cells**  
16 p0520 N77-29604
- Automated fabrication of back surface field silicon solar cells with screen printed wraparound contacts**  
16 p0546 N77-32590
- SPEBRY RAND CORP., HUNTSVILLE, ALA.**  
Small space station electrical power system design concepts  
13 p0040 A77-12835
- SPEBRY RAND RESEARCH CENTER, SUDBURY, MASS.**  
Geothermal down-well pumping system  
14 p0252 N77-21732
- SPRINGBOOM LABS., INC., ENFIELD, CONN.**  
Investigation of test methods, material properties and processes for solar cell encapsulants  
16 p0550 N77-33347
- STANDARD ELECTRIC LORENZ A.G., STUTTGART (WEST GERMANY).**  
Environmental protection measuring technique. Sensor for automatic continuous emission control of gases  
14 p0209 N77-16467
- STANFORD RESEARCH INST., ARLINGTON, VA.**  
Meeting report: Advanced fossil fuels sector group  
13 p0099 N77-11549
- STANFORD RESEARCH INST., MENLO PARK, CALIF.**  
Research to anticipate environmental impacts of changing resource usage  
13 p0101 N77-11602
- Costs of alternative sources of electricity**  
13 p0107 N77-12528
- Impacts of synthetic liquid fuel development. Automotive market. Volume 1: Summary**  
13 p0107 N77-12533
- Impacts of synthetic liquid fuel development. Automotive market. Volume 2**  
13 p0108 N77-12534
- Technology impact assessment of the hydrogen economy concept: Key findings**  
14 p0246 N77-21653
- A western regional energy development study: Economics. Volume 1: SRI energy model results**  
14 p0251 N77-21706
- Long term energy alternatives for automotive propulsion. Synthetic fuel versus battery/electric system**  
15 p0361 N77-24504
- Long term energy alternatives for automotive propulsion: Synthetic fuel versus battery/electric system**  
15 p0361 N77-24505
- The hydrogen economy: A preliminary technology assessment**  
16 p0512 N77-28329
- The potential for reusable homogeneous containers**  
16 p0518 N77-29007
- Field ionization for laser isotope separation**  
16 p0552 N77-33512
- STANFORD UNIV., CALIF.**  
Applied research on II-VI compound  
13 p0098 N77-11547
- Proceedings of the Workshop on Modeling the Interrelationships between the Energy Sector and the General Economy**  
13 p0100 N77-11561
- Heat treatment of refuse for increasing anaerobic biodegradability**  
13 p0101 N77-11577
- Limiting mechanisms in MHD generator performance**  
13 p0111 N77-12879
- Abstracts: 1976 AFOSR Contractors' meeting on MHD Power Generation and Lasers**  
13 p0133 N77-15845
- Hydrogen production plants using electrolytic cells with low cost electrodes built into pressure tanks**  
14 p0239 N77-21599
- Photovoltaic II-VI compound heterojunctions for solar energy conversion**  
14 p0251 N77-21702
- Workshop on Geothermal Reservoir Engineering**  
14 p0251 N77-21709
- Mathematical modelling of single-phase nonisothermal fluid flow through porous media**  
15 p0362 N77-24577
- Energy models and large-scale systems optimization**  
15 p0365 N77-24619
- Numerical solution of heat conduction with phase change in cylindrical systems**  
16 p0543 N77-32422
- Evaluation of the CdS/CdTe heterojunction solar cell**  
16 p0545 N77-32584
- Heat treatment of refuse for increasing anaerobic biodegradability**  
16 p0550 N77-32995
- STATE UNIV. OF NEW YORK, BUFFALO.**  
Electric energy usage and regional economic development  
14 p0208 N77-16449
- STATE UNIV. OF NEW YORK, STONY BROOK.**  
Planner's energy workbook: A users' manual for land use and energy utilization  
15 p0364 N77-24596
- STATE UNIV. OF NEW YORK AT BUFFALO, AMHERST.**  
High power study - power conditioning  
16 p0522 N77-29625
- STEVENS INST. OF TECH., HOBOKEN, N. J.**  
Hydrogen energy conversion  
14 p0218 N77-18601
- STOCKHOLM UNIV. (SWEDEN).**  
An estimate of the interaction of a limited array of windmills  
13 p0114 N77-13539

- SYRACUSE UNIV., N. Y.  
Commercial building unitary heat pump system  
with solar heating  
[PB-255488/9] 13 p0099 N77-11551
- SYSTEMS APPLICATIONS, INC., SAN RAFAEL, CALIF.  
Theoretical, numerical, and physical techniques  
for characterizing power plant plumes  
[PB-253099/6] 13 p0101 N77-11599
- The chemistry, dispersion, and transport of air  
pollutants emitted from fossil fuel power  
plants in California: Data analysis and  
emission impact model  
[PB-264822/8] 16 p0517 N77-28628
- SYSTEMS CONTROL, INC., PALO ALTO, CALIF.  
The analysis of subsidence associated with  
geothermal development. Volume 1: Handbook  
[PB-263692/6] 15 p0369 N77-24714
- The analysis of subsidence associated with  
geothermal development. Volume 2: Research  
report  
[PB-263693/4] 15 p0369 N77-24715
- The analysis of subsidence associated with  
geothermal development. Volume 3:  
Information bank  
[PB-263694/2] 15 p0369 N77-24716
- SYSTEMS SCIENCE AND SOFTWARE, LA JOLLA, CALIF.  
Computer modeling of coal gasification reactors  
[FE-1770-4] 13 p0093 N77-10812
- Geohydrological environmental effects of  
geothermal power production, phase 2A  
[PB-261687/8] 15 p0347 N77-22653
- Computer simulation of geothermal reservoirs  
[PB-265104/0] 15 p0395 N77-27564

## T

- TECHNIDYNE, INC., HASPETH, N. Y.  
Automotive fuel saving system with on-board  
hydrogen generation and injection into IC  
engines  
14 p0242 N77-21618
- TECHNION - ISRAEL INST. OF TECH., HAIFA.  
Flap-augmented shrouds for aerogenerators  
14 p0183 A77-26085
- Hydrogen vehicular fuel storage as a step in a  
water splitting cycle  
14 p0242 N77-21615
- TECHNISCHE HOCHSCHULE, AACHEN (WEST GERMANY).  
Feasibility studies of chemical reactions for  
thermochemical water splitting cycles of the  
iron-chlorine, iron-sulfur- and  
manganese-sulfur families  
14 p0238 N77-21572
- TECHNISCHE HOCHSCHULE, MUNICH (WEST GERMANY).  
The pros and cons of variable geometry turbines  
15 p0340 N77-22140
- TECHNISCHE HOOGESCHOOL, DELFT (NETHERLANDS).  
Comparative wind tunnel investigation of sail  
profiles for windmills  
[VTH-191] 13 p0111 N77-13012
- TECHNISCHE HOOGESCHOOL, EINDHOVEN (NETHERLANDS).  
A numerical model to evaluate the behavior of a  
regenerative heat exchanger at high temperature  
[TH-76-E-66] 15 p0377 N77-26439
- TEKNEKRON, INC., BERKELEY, CALIF.  
Assessment of the impact of proposed thermal  
effluent guidelines for the steam electric  
power industry  
[PB-255937/5] 13 p0110 N77-12587
- TELEDYNE ENERGY SYSTEMS, TIMONIUM, MD.  
Recent developments of large electrolytic  
hydrogen generators  
14 p0238 N77-21592
- TEMPLE, PARKER AND SLOANE, INC., WELLESLEY HILLS,  
MASS.  
Study of the electric utility industry demand,  
costs, and rates  
[PB-262843/6] 15 p0367 N77-24631
- TENNESSEE UNIV., KNOXVILLE.  
On the nature of fluctuations in an open cycle  
magnetohydrodynamic generator  
13 p0117 N77-13841
- Thermal effects on biodegradation of pollutants  
in water  
[PB-261512/8] 15 p0350 N77-22709

- TENNESSEE VALLEY AUTHORITY, CHATTANOOGA.  
Study of the feasibility of a regional solid  
waste derived fuel system in the Tennessee  
Valley Authority service area  
[PB-259764/9] 14 p0227 N77-19956
- TETRA TECH, INC., ARLINGTON, VA.  
Energy fact book 1975. Parts 1-5: Appendixes A-H  
[AD-A023010] 13 p0089 N77-10664
- Energy use in the contract construction industry  
[PB-245422/1] 13 p0099 N77-11557
- Energy use in the contract construction  
industry. Appendix A: Study methodology  
[PB-245423/9] 13 p0099 N77-11558
- Analysis of the technical and cost feasibility  
of solar and/or wind energy systems for Coast  
Guard public quarters  
[AD-A028332] 14 p0209 N77-16460
- Energy fact book 1976, chapters 1 through 21  
[AD-A028284] 14 p0218 N77-18592
- Energy fact book, 1977  
[AD-A038802] 16 p0522 N77-29624
- US Navy energy R and D  
[AD-A039546] 16 p0529 N77-30623
- TEXACO, INC., EL MONTE, CALIF.  
Hydrogen production from coal liquefaction  
residues  
[PB-261734/8] 15 p0350 N77-22687
- TEXACO, INC., MONTEBELLO, CALIF.  
Hydrogen production from coal liquefaction  
residues  
[EPRI-AP-233] 16 p0551 N77-33374
- TEXAS A&M UNIV., COLLEGE STATION.  
Proceedings of a workshop on environmental  
oceanography of the Gulf of Mexico  
[ORO-5017-1] 15 p0386 N77-26787
- Further development of the compressed-film  
floating-deck solar water heater  
[PB-268514/7] 16 p0547 N77-32603
- TEXAS INSTRUMENTS, INC., DALLAS.  
Large area Czochralski silicon for solar cells  
16 p0486 A77-49054
- Automated array assembly task, phase 1  
[NASA-CR-153909] 15 p0391 N77-27505
- TEXAS UNIV., AUSTIN.  
Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 4: Surface  
technology and resource utilization  
[CONF-760222-P4] 14 p0248 N77-21675
- Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 2: Resource  
Assessment  
[CONF-760222-P2] 14 p0249 N77-21677
- Proceedings of Second Geopressured Geothermal  
Energy Conference. Volume 3: Reservoir  
Research and Technology  
[CONF-760222-P3] 14 p0249 N77-21678
- Numerical simulation of United States Gulf Coast  
geothermal geopressured reservoirs  
16 p0545 N77-32585
- An investigation of peristaltic pumping  
phenomena with wind energy applications  
16 p0545 N77-32586
- Energy management for Texas commerce and industry  
[PB-268409/0] 16 p0548 N77-32616
- TEXAS UNIV., DALLAS.  
Thermal conductivity measurement and prediction  
from geophysical well log parameters with  
borehole application  
[PB-262372/6] 15 p0347 N77-22654
- THERMO ELECTRON CORP., WALTHAM, MASS.  
Advanced thermionic converter development  
13 p0043 A77-12862
- Thermionic converter studies at Thermo Electron  
16 p0466 A77-48887
- Thermionic converter performance with oxide  
collectors  
16 p0466 A77-48888
- A study of implant electric power generation in  
the chemical, petroleum refining, and paper  
and pulp industries  
[PB-255658/7] 13 p0115 N77-13542
- A study of implant electric power generation in  
the chemical, petroleum refining, and paper  
and pulp industries  
[PB-255659/5] 13 p0115 N77-13543
- Technical and economic feasibility of solar  
augmented process steam generation  
[COO-2732-1] 14 p0250 N77-21692



- Feasibility test on compounding the internal combustion engine for automotive vehicles, task 2  
[COO-2690-1] 16 p0512 N77-28495
- High efficiency thermionic converter studies  
[NASA-CR-135263] 16 p0546 N77-32592
- TOKYO UNIV. (JAPAN).  
Effective conversion processes between thermal and chemical energies: Thermodynamic study of multistep water decomposition processes  
14 p0238 N77-21576
- TORONTO UNIV. (ONTARIO).  
Utilization of geothermal energy  
[UTIAS-REVIEW-40] 13 p0087 N77-10644
- TRANSEMANITICS, INC., WASHINGTON, D.C.  
Industrial development of silicon solar cells  
[NASA-TT-P-17139] 13 p0097 N77-11528
- TRANSPORTATION RESEARCH BOARD, WASHINGTON, D. C.  
Utility facilities in transportation corridors  
[PB-255635/5] 13 p0093 N77-10970
- Optimizing the use of materials and energy in transportation construction  
[PB-253713/2] 13 p0096 N77-11475
- TRISNET. Directory to transportation research information resources  
[PB-255172/9] 13 p0125 N77-14939
- Transportation programming, economic analysis, and evaluation of energy constraints  
[PB-262878/2] 15 p0370 N77-25018
- TRANSPORTATION SYSTEMS CENTER, CAMBRIDGE, MASS.  
The 1975 automotive characteristics data base  
[PB-262015/1] 15 p0354 N77-23507
- Energy statistics: A supplement to the summary of national transportation statistics  
[PB-269301/8] 16 p0559 N77-33672
- TRW DEFENSE AND SPACE SYSTEMS GROUP, REDONDO BEACH, CALIF.  
Excess liquid in heat-pipe vapor spaces  
[AIAA PAPER 77-748] 15 p0311 A77-37261
- Solar cell array design handbook, volume 1  
[NASA-CR-149364] 13 p0118 N77-14193
- Computer program grade 2 for the design and analysis of heat-pipe wicks  
[NASA-CR-137954] 13 p0118 N77-14375
- Development program for solid electrolyte batteries  
[PB-260719/0] 15 p0341 N77-22398
- Transmitter experiment package for the communications technology satellite  
[NASA-CR-135035] 15 p0360 N77-24332
- Investigation of beamed energy concepts for propulsion. Volume 1: Systems studies  
[AD-A034995] 15 p0377 N77-26491
- TRW 25 MW/sub T/staged MHD coal combustor conceptual design study  
[TID-27145] 15 p0396 N77-27922
- Planning and design of additional East Mesa Geothermal Test Facilities. Phase 1B, Volume 2: Procurement package  
[SAN/1140-1/2-VOL-2] 16 p0558 N77-33657
- TRW, INC., CLEVELAND, OHIO.  
Performance data for a terrestrial solar photovoltaic/water electrolysis experiment  
15 p0256 A77-30321
- TRW, INC., MCLEAN, VA.  
The strategic petroleum reserve and liquefied natural gas supplies  
[PB-265488/7] 16 p0520 N77-29598
- TRW SYSTEMS, REDONDO BEACH, CALIF.  
A study of geothermal prospects in the western United States  
[NASA-CR-149812] 14 p0220 N77-19575
- Destroying chemical wastes in commercial scale incinerators. Facility report no. 2, Surface Combustion Division, Midland-Ross Corporation  
[PB-268232/6] 16 p0542 N77-32051
- TRW SYSTEMS GROUP, MCLEAN, VA.  
Consumer thermal energy storage costs for residential hot water, space heating and space cooling systems  
[ANL-K-76-3364-1] 16 p0556 N77-33631
- Systems studies of energy conservation: Methane produced from coalbeds, volume 1  
[MERC/CR-77/4-VOL-1] 16 p0558 N77-33660
- TRW SYSTEMS GROUP, REDONDO BEACH, CALIF.  
Field test sampling/analytical strategies and implementation cost estimates: Coal gasification and flue gas desulfurization  
[PB-254166/2] 13 p0101 N77-11581
- Heat pipe materials compatibility  
[NASA-CR-135069] 13 p0103 N77-12182
- Flight data analysis and further development of variable-conductance heat pipes  
[NASA-CR-137953] 13 p0118 N77-14374
- TOLSA UNIV., OKLA.  
Drag reduction in cocurrent horizontal natural gas-hexane pipe flow  
16 p0519 N77-29441
- U**
- ULTRASYSTEMS, INC., IRVINE, CALIF.  
Examination of the costs, benefits and energy conservation aspects of the NASA aircraft fuel conservation technology program  
[NASA-CR-152683] 15 p0352 N77-23007
- UNION CARBIDE CORP., TONAWANDA, N.Y.  
A study of the efficiency of hydrogen liquefaction  
15 p0279 A77-33377
- A study of the efficiency of hydrogen liquefaction  
14 p0240 N77-21611
- UNITED AIR LINES, INC., CHICAGO, ILL.  
An exploratory study to determine the integrated technological air transportation system ground requirements of liquid-hydrogen-fueled subsonic, long-haul civil air transports  
[NASA-CR-2699] 13 p0083 N77-10033
- UNITED ENGINEERS AND CONSTRUCTORS, INC., PHILADELPHIA, PA.  
Preliminary assessment of economics of hydrogen production from Lawrence Livermore Laboratory ZnSe thermochemical cycle  
[UCRL-13711] 16 p0536 N77-31626
- Gas cooled reactor assessment, volume 1  
[TID-27424-VOL-1] 16 p0541 N77-31945
- UNITED TECHNOLOGIES CORP., EAST HARTFORD, CONN.  
High efficiency engine cycles for air transport fuel economy  
15 p0339 N77-22126
- UNITED TECHNOLOGIES CORP., SOUTH WINDSOR, CONN.  
National benefits associated with commercial application of fuel cell powerplants  
[ERDA-76-54] 13 p0123 N77-14597
- Energy Conversion Alternatives Study (ECAS), phase 2. Integrated coal gasifier/molten carbonate fuel cell powerplant conceptual design and implementation assessment.  
[NASA-CR-134955] 15 p0380 N77-26637
- Thermal barrier coating on high temperature industrial gas turbine engines  
[NASA-CR-135147] 15 p0390 N77-27496
- Advanced technology fuel cell program  
[EPRI-EM-335] 15 p0391 N77-27508
- UNITED TECHNOLOGIES RESEARCH CENTER, EAST HARTFORD, CONN.  
Effects of selected R&D options on fuel usage in the commercial air system  
14 p0201 A77-29472
- Gaseous fuel reactors for power systems  
16 p0468 A77-48906
- Fuel gas environmental impact  
[PB-257134/7] 14 p0209 N77-16470
- Preliminary feasibility evaluation of compressed air storage power systems, volume 1  
[CONS/NSF/42-1] 16 p0556 N77-33636
- UNIVERSAL ENERGY SYSTEMS, INC., DAYTON, OHIO.  
Electrofluid dynamics energy conversion research  
[AD-A029066] 14 p0218 N77-18593
- Fluid dynamic energy conversion and transfer processes  
[AD-A040589] 16 p0533 N77-31444
- UNIVERSITY ENGINEERS, INC., NORMAN, OKLA.  
Small scale tests on control methods for some liquefied natural gas hazards  
[AD-A033522] 15 p0341 N77-22293
- UNIVERSITY OF SOUTHERN CALIF., LOS ANGELES.  
Temperature effects of crude oil in the upper intertidal zone  
[PB-255956/5] 13 p0110 N77-12581
- UOP, INC., DES PLAINES, ILL.  
Optimization of PT-doped Kocite (trademark) electrodes in H<sub>2</sub> P04 fuel cells  
[AD-A025326] 13 p0107 N77-12529
- Optimization of PT-doped Kocite (R) trademark electrodes in H<sub>2</sub> P04 fuel cells  
[AD-A034604] 15 p0365 N77-24618

- Optimization of platinum-doped Kocite electrodes in H<sub>3</sub>PO<sub>4</sub> fuel cells  
[AD-A039242] 16 p0529 N77-30626
- URBAN MASS TRANSPORTATION ADMINISTRATION, WASHINGTON, D.C.  
Future scenarios for urban transportation  
[PB-255349/3] 13 p0102 N77-11930
- URBAN SYSTEMS RESEARCH AND ENGINEERING, INC., CAMBRIDGE, MASS.  
Baseline energy forecasts and analysis of alternative strategies for airline fuel conservation  
[PB-255351/9] 13 p0091 N77-10690
- UTAH STATE UNIV., LOGAN.  
A fermentation process for converting plant materials into methane  
13 p0121 N77-14583
- UTAH UNIV., SALT LAKE CITY.  
Dipole-dipole resistivity surveys, Roosevelt hot springs KGRA, volume 2  
[PB-264897/0] 15 p0371 N77-25623
- Geochemistry and hydrothermal alteration at selected Utah hot springs, volume 3  
[PB-264415/1] 15 p0378 N77-26606
- University of Utah direct contact Geothermal Power Project report. A computer program for determining the thermodynamic properties of water  
[UTEC-NE-76-171] 15 p0380 N77-26642
- Earthquake surveys of the Roosevelt Hot Springs and the Cove Fort areas, Utah, volume 4  
[PB-268421/5] 16 p0544 N77-32574
- Thermal gradient and heat flow drilling, volume 5  
[PB-268422/3] 16 p0544 N77-32577
- Gravity and ground magnetic surveys of the central mineral mountains, Utah, volume 6  
[PB-268423/1] 16 p0544 N77-32578

## V

- VIRGINIA POLYTECHNIC INST. AND STATE UNIV., BLACKSBURG.  
Evaluation and targeting of geothermal energy resources in the southeastern United States  
[VPI-SU-5103-1] 14 p0225 N77-19642
- Hydrogen-powered highway vehicles: Applications and optimum form of fuel storage  
14 p0242 N77-21616
- VIRGINIA UNIV., CHARLOTTESVILLE.  
Performance and analysis of SOLARIS water-trickle solar collector  
[CONF-760821-9] 14 p0232 N77-20599
- Analysis of thermal performance of Solaris water-trickle solar collector  
[CONF-761117-17] 15 p0382 N77-26668
- Evaluation of Solaris water-trickle solar collector and demonstration of annual cycle collection and storage of solar heated water  
[CONF-761143-1] 15 p0382 N77-26669
- Engineering analysis and testing of water-trickle solar collector  
[ORO-4927-76-2] 15 p0391 N77-27506
- VOORHEES (ALAN M.) AND ASSOCIATES, INC., MCLEAN, VA.  
Study of future paratransit requirements  
[PB-264082/9] 15 p0376 N77-26028

## W

- WASHINGTON STATE UNIV., PULLMAN.  
An investigation of condensation heat transfer in a closed tube containing a soluble noncondensable gas  
[NASA-CR-149095] 13 p0085 N77-10465
- Societal implications of energy scarcity. Social and technological priorities in steady state and constricting systems  
[PB-253097/0] 13 p0099 N77-11556
- WASHINGTON UNIV., SEATTLE.  
Assessing the relationship between urban form and travel requirements: A literature review and conceptual framework  
[PB-254988/9] 13 p0102 N77-11923
- Electric power development in the Pacific Northwest Region: Institutional commitments and alternatives, phase 1  
[PB-262382/5] 15 p0348 N77-22671

- WATER PURIFICATION ASSOCIATES, CAMBRIDGE, MASS.  
Water requirements for steam-electric power generation and synthetic fuel plants in the western United States  
[PB-268067/7] 16 p0540 N77-31667
- WATERLOO UNIV. (ONTARIO).  
WATSON: A solar heating simulation and economic evaluation program  
[NP-21307] 15 p0364 N77-24603
- Determining the technical and economic feasibility of utilizing solar energy for heating buildings in Canada  
[NP-21308] 15 p0365 N77-24611
- Studies on methods of reducing heat losses from flat plate solar collectors  
[COO-2597-2] 15 p0395 N77-27554
- WAYNE STATE UNIV., DETROIT, MICH.  
An experimental study supported by a computer simulation in a prechamber CFR diesel engine leading to a modified cetane scale for rating low ignition quality fuels  
16 p0525 N77-30259
- WENDELL ASSOCIATES, MCLEAN, VA.  
Federal assistance programs and energy development-impacted municipalities  
[PB-265804/5] 16 p0519 N77-29026
- WEST VIRGINIA UNIV., MORGANTOWN.  
Simulation of fluidized bed combustors. I - Combustion efficiency and temperature profile  
14 p0145 A77-21698
- The use of an interactive energy model for technology assessment with special reference to underground coal gasification  
[PB-255543/1] 13 p0098 N77-11545
- WESTERN FOREST PRODUCTS LAB., VANCOUVER (BRITISH COLUMBIA).  
Energy self-sufficiency prospects for the British Columbia forest products industry  
[VP-X-166] 15 p0363 N77-24591
- WESTERN ONTARIO UNIV., LONDON.  
Microbial hydrogen production  
14 p0239 N77-21601
- WESTINGHOUSE ELECTRIC CORP., EAST PITTSBURGH, PA.  
Silicon solar photovoltaic power stations  
[AIAA 77-1021] 16 p0404 A77-41563
- WESTINGHOUSE ELECTRIC CORP., LESTER, PA.  
Advanced coal gasification system for electric power generation  
[FE-1514-176] 13 p0088 N77-10653
- WESTINGHOUSE ELECTRIC CORP., LIMA, OHIO.  
High power study, superconducting generators  
[AD-A031620] 15 p0342 N77-22408
- WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.  
Liquid-metal magnetohydrodynamic system evaluation  
13 p0034 A77-12784
- Nuclear driven water decomposition plant for hydrogen production  
13 p0035 A77-12791
- Hydrogen production by water decomposition using a combined electrolytic-thermochemical cycle  
15 p0277 A77-33356
- Silicon solar photovoltaic power stations  
[AIAA 77-1021] 16 p0404 A77-41563
- Hydrogen production by water decomposition using a combined electrolytic thermochemical cycle  
14 p0238 N77-21589
- Hydrogen generation process  
[FE-2262-3] 16 p0533 N77-31337
- Analysis and forecast of electrical distribution system materials. Volume 3: Appendix  
[CONS/2050-1-VOL-3-APP] 16 p0551 N77-33430
- Study of the auxiliaries for lead-acid battery systems for peaking power  
[CONS/2114-3] 16 p0556 N77-33634
- WESTINGHOUSE RESEARCH LABS., PITTSBURGH, PA.  
Design of closed-cycle MHD generator with nonequilibrium ionization and system  
15 p0303 A77-36387
- Thin film solar cells for terrestrial applications  
[PB-255606/6] 13 p0109 N77-12553
- The Westinghouse sulfur cycle for the thermochemical decomposition of water  
14 p0238 N77-21587
- Energy Conversion Alternatives Study (ECAS), Phase 2. Volume 1: Summary and combined gas-stream turbine plant with an integrated low-BTU gasifier  
[NASA-CR-134942-VOL-1] 15 p0379 N77-26628

- Energy Conversion Alternatives Study (ECAS),  
Phase 2. Volume 2: Summary and combined  
gas-steam turbine plant using coal derived  
liquid fuel  
[NASA-CR-134942-VOL-2] 15 p0379 N77-26629
- Energy Conversion Alternatives Study (ECAS),  
Phase 2. Volume 3: Summary and advanced  
steam plant with pressurized fluidized bed  
boilers  
[NASA-CR-134942-VOL-3] 15 p0379 N77-26630
- Thin film solar cells for terrestrial applications  
[PB-265983/7] 16 p0523 N77-29635
- WILSON, JONES, HORTON AND LYNCH, SAN MATEO, CALIF.  
Santa Clara, California, community center,  
commercial solar demonstration legal  
alternatives, implications, and financing of  
solar heating and cooling by a municipal  
corporation  
[SAN/1083-76/1] 15 p0394 N77-27549
- WISCONSIN UNIV., MADISON.  
Increased fuel economy in transportation systems  
by use of energy management: Second year's  
program. Executive summary  
[PB-256117/3] 13 p0108 N77-12536
- A design procedure for solar heating systems  
13 p0128 N77-15485
- Increased fuel economy in transportation systems  
by use of energy management - second year's  
program  
[PB-257177/6] 13 p0133 N77-15930
- Discovery of reaction sequences for  
thermochemical water splitting  
[AD-A029959] 14 p0228 N77-20191
- Discovery of reaction sequences for  
thermochemical water splitting  
14 p0238 N77-21575
- What is past is prologue: Future directions in  
Tokamak power reactor design research  
[UWPDH-175] 15 p0358 N77-23951
- Calculation of monthly average insolation on  
tilted surfaces  
[CONF-760842-15] 15 p0387 N77-27057
- Parametric study of critical fuel costs for  
solar heating in North America  
[CONF-760842-12] 15 p0392 N77-27533
- Simulation study of several solar heating  
systems with offpeak auxiliary  
[CONF-760842-13] 15 p0393 N77-27534
- Review of solar cooling  
[CONF-760842-9] 15 p0393 N77-27535
- Performance of a solar heating system utilizing  
phase-change energy storage  
[CONF-760842-11] 15 p0393 N77-27540
- Design procedure for solar air heating systems  
[CONF-760842-14] 16 p0514 N77-28589
- WORLD METEOROLOGICAL ORGANIZATION, GENEVA  
(SWITZERLAND).  
Weather, climate and human settlements  
[WMO-448] 15 p0387 N77-27038
- WORMSER SCIENTIFIC CORP., STAMFORD, CONN.  
Solar house heating system using reflective  
pyramid optical condensing system  
[COO-2769-4] 16 p0522 N77-29619
- WYLE LABS., INC., HUNTSVILLE, ALA.  
Assembly and testing of a 1.8 by 3.7 meter  
Fresnel lens solar concentrator  
[NASA-CR-150300] 15 p0378 N77-26610
- WYOMING UNIV., LARAMIE.  
Evaluation of wind-energy sites from aeolian  
geomorphologic features mapped from LANDSAT  
imagery. First results  
[ERDA/NSF-00598/75/T1] 14 p0218 N77-18667

## X

- XEROX ELECTRO-OPTICAL SYSTEMS, PASADENA, CALIF.  
Thermal energy storage demonstration unit for  
Vuilleumier cryogenic cooler  
[AD-A040895] 16 p0553 N77-33613

## Y

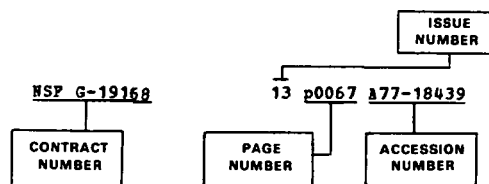
- YARDNEY ELECTRIC CORP., PAWCATUCK, CONN.  
Design and cost study of a zinc/nickel oxide  
battery for electric vehicle propulsion  
[ANL-K-76-3543-1] 16 p0556 N77-33635

# CONTRACT NUMBER INDEX

ENERGY / A Continuing Bibliography (Issue 16)

JANUARY 1978

## Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the IAA accession numbers appearing first. The accession number denotes the number by which the citation is identified in either the IAA or STAR section. Preceding the accession number are the issue and page number in the particular supplement in which the citation may be found.

AP PROJ. 0310  
16 p0547 N77-32599  
AP PROJ. 1929  
16 p0533 N77-31444  
AP PROJ. 2126  
16 p0547 N77-32599  
AP PROJ. 3048  
13 p0112 N77-13234  
14 p0219 N77-19278  
AP PROJ. 3145  
13 p0108 N77-12539  
13 p0111 N77-12879  
15 p0397 N77-27983  
16 p0522 N77-29625  
AP PROJ. 6302  
13 p0127 N77-15213  
AP PROJ. 6813  
13 p0133 N77-15845  
AP PROJ. 7116  
14 p0218 N77-18593  
AP PROJ. 9752  
13 p0133 N77-15845  
AP-APFOSR-74-2712  
16 p0467 A77-48897  
ARB-3-929  
13 p0092 N77-10720  
ARB-4-258  
16 p0517 N77-28628  
ARB-4-421  
15 p0348 N77-22668  
ARGC-B75/15538  
16 p0435 A77-47358  
16 p0435 A77-47359  
ARPA ORDER 2209  
15 p0375 N77-25677  
ARPA ORDER 2615  
14 p0218 N77-18601  
ARPA ORDER 2630  
14 p0226 N77-19662  
14 p0226 N77-19663  
ARPA ORDER 3005  
15 p0366 N77-24630  
AT (04-3)-1075  
13 p0044 A77-12872  
AT (04-3)-1084  
14 p0248 N77-21673  
AT (04-03)-1086  
13 p0030 A77-12750  
AT (10-1)-1523  
15 p0380 N77-26642  
AT (29-1)-789  
16 p0399 A77-40553  
16 p0491 A77-49099  
13 p0088 N77-10655  
13 p0097 N77-11537  
13 p0122 N77-14587  
14 p0211 N77-17571  
14 p0214 N77-18057  
14 p0217 N77-18576  
14 p0223 N77-19616  
14 p0224 N77-19638  
14 p0250 N77-21688  
AT (40-1)-4908  
13 p0088 N77-10657  
AT (40-1)-4927  
15 p0382 N77-26668  
AT (45-1)-1830  
15 p0321 A77-38527  
16 p0482 A77-49028  
AT (45-1)-2170  
13 p0131 N77-15509  
AT (45-1)-2225-140  
16 p0439 A77-48099  
AT (49-15)-3063  
13 p0094 N77-11108  
AT (49-15)-3069  
13 p0041 A77-12840  
BNFT-ET-45  
14 p0149 A77-21798  
BNFT-ET-4135-A  
14 p0209 N77-17112  
BNFT-NT-196 (NT-4196A)  
14 p0210 N77-17372  
BNFT-NT-4471  
13 p0026 A77-12716  
BNFT-WT08-61  
14 p0209 N77-16467  
BNFT-TV-7601-4  
16 p0401 A77-41257  
BNFT-WRT-2073  
14 p0212 N77-17584  
CNR-75,01172,11,115,4858  
15 p0291 A77-35015  
DA PROJ. 1F2-62208-AH-90  
13 p0102 N77-12052  
DA PROJ. 1G7-62708-AH-67  
13 p0107 N77-12529  
15 p0365 N77-24618  
DA PROJ. 1G7-62708-AH-78  
16 p0529 N77-30626  
DA PROJ. 1L1-61102-AH-45  
15 p0370 N77-25086  
DA PROJ. 1L7-62705-A-1194  
16 p0526 N77-30373  
DA PROJ. 1T0-61102-A-34A  
14 p0213 N77-17603  
DA PROJ. 1T1-61101-A-91A  
14 p0213 N77-17605  
DA PROJ. 1T1-61102-A-34A  
13 p0090 N77-10681

13 p0132 N77-15519  
15 p0367 N77-24632  
DA PROJ. 4A7-62719-AT-06  
13 p0126 N77-14957  
DA PROJ. 4A7-62719-AT-41  
16 p0521 N77-29608  
DA PROJ. 4A7-62720-A-896  
15 p0356 N77-23614  
DA PROJ. 4A7-63734-DT-08  
13 p0124 N77-14606  
15 p0373 N77-25660  
DA-PRO-75-G025  
14 p0177 A77-24573  
DAAB07-76-C-1301  
15 p0371 N77-25447  
DAAD05-72-C-0427  
15 p0342 N77-22490  
DAAD05-76-Q-5603  
16 p0439 A77-48158  
DAAG29-75-C-0024  
14 p0228 N77-20191  
DAAG53-76-C-0001  
15 p0367 N77-24632  
DAAG53-76-C-0003  
15 p0377 N77-26330  
DAAG53-76-C-0014  
13 p0107 N77-12529  
15 p0365 N77-24618  
16 p0529 N77-30626  
DAAG53-76-0001  
14 p0195 A77-28166  
DAAH01-72-C-0982  
15 p0375 N77-25677  
DAAJ02-74-C-0066  
13 p0102 N77-12052  
DAAK02-72-C-0084  
14 p0195 A77-28166  
13 p0090 N77-10681  
DAAK02-74-C-0367  
13 p0090 N77-10684  
14 p0213 N77-17603  
15 p0380 N77-26641  
DAAK02-75-C-0045  
15 p0380 N77-26640  
DAAK02-75-C-0082  
15 p0342 N77-22490  
15 p0377 N77-26330  
DAAK02-75-C-0096  
15 p0398 N77-28040  
DACA23-74-C-009  
13 p0021 A77-12671  
16 p0497 A77-49154  
DACA23-74-C-0009  
15 p0315 A77-37667  
14 p0226 N77-19662  
14 p0226 N77-19663  
DACA23-76-C-0001  
16 p0521 N77-29608  
DAHC04-75-G-0144  
15 p0366 N77-24630  
DAHC15-67-C-0158  
16 p0553 N77-33610  
DAHC15-73-C-0200  
16 p0554 N77-33617  
DGRST-73-7-1322  
13 p0014 A77-11591  
DGRST-74-7-1375  
13 p0014 A77-11591  
DGRST-75-7-1302  
16 p0546 N77-32589  
DI-AA550-CT6-61  
16 p0549 N77-32681  
DI-BH-G0 155116  
15 p0341 N77-22295  
DI-BH-G0-254032  
16 p0516 N77-28613  
DI-BH-H0-166034  
15 p0360 N77-24371  
DI-BH-H0-230012  
15 p0368 N77-24711  
DI-BH-H0-357078  
13 p0095 N77-11380

DI-BH-J0-155086  
16 p0525 N77-30255  
DI-BH-J0-255021  
15 p0389 N77-27247  
DI-BH-P0-152048  
14 p0252 N77-21725  
DI-BH-S0-144081  
15 p0372 N77-25625  
DI-BH-S0-144093  
15 p0346 N77-22644  
15 p0346 N77-22645  
DI-6-07-D8-50090  
16 p0548 N77-32618  
DI-14-01-0001-1664  
13 p0099 N77-11557  
13 p0099 N77-11558  
13 p0100 N77-11559  
DI-14-01-0001-1700  
15 p0370 N77-25014  
DI-14-01-0001-1899  
15 p0367 N77-24631  
DI-14-01-0001-2115  
13 p0110 N77-12592  
DI-14-01-0001-2141  
15 p0291 A77-35141  
DI-14-01-0001-2156  
14 p0225 N77-19657  
14 p0225 N77-19658  
DI-14-03-6100H  
13 p0115 N77-13550  
DI-14-03-6101H  
13 p0099 N77-11552  
13 p0107 N77-12526  
DI-14-03-6108H  
13 p0107 N77-12528  
DI-14-06-300-2479  
13 p0132 N77-15520  
DI-14-09-0060-5152  
15 p0370 N77-25280  
DI-14-09-0070-653  
15 p0347 N77-22646  
DI-14-30-3313  
14 p0234 N77-20656  
DI-14-31-001-3541  
15 p0368 N77-24673  
DI-14-31-0001-3503  
13 p0126 N77-14960  
DI-14-31-0001-4174  
15 p0352 N77-23022  
DI-14-31-0001-4210  
15 p0367 N77-24634  
DI-14-31-0001-5070  
16 p0539 N77-31664  
DI-14-31-0001-5223  
15 p0367 N77-24634  
DI-14-31-0001-5254  
15 p0354 N77-23592  
DI-14-32-001-1225  
13 p0008 A77-11242  
DI-14-32-001-1227  
15 p0288 A77-33110  
DI-14-32-0001-1224  
13 p0008 A77-11243  
DI-14-34-0001-6042  
15 p0368 N77-24613  
DI-14-34-0001-6050  
15 p0348 N77-22671  
DI-08550-CTS-48  
15 p0343 N77-22604  
DI-08550-CTS-46  
15 p0385 N77-26693  
DI-08550-CT6-46  
15 p0383 N77-26677  
DOS-1753-600100  
15 p0368 N77-24109  
DOT-AT-60008  
16 p0518 N77-29003  
DOT-CG-81-75-1364  
16 p0531 N77-30841  
DOT-CG-23223  
15 p0360 N77-24410

# CONTRACT NUMBER INDEX

DOT-CG-42355-A  
 15 p0341 N77-22293  
 DOT-CG-50960-A  
 14 p0209 N77-16460  
 DOT-CG-51487-A  
 13 p0110 N77-12572  
 DOT-FH-11-9209  
 16 p0524 N77-29640  
 DOT-OS-30112  
 13 p0020 A77-12664  
 13 p0108 N77-12536  
 13 p0133 N77-15930  
 DOT-OS-50240  
 15 p0287 A77-33600  
 DOT-OS-60072  
 13 p0125 N77-14939  
 DOT-OS-60177  
 16 p0444 A77-48705  
 DOT-OST-20019  
 15 p0398 N77-28046  
 DOT-TSC-RA-75-10  
 15 N77-22725  
 DOT-TSC-989  
 13 p0066 A77-18232  
 DOT-TT-60006  
 13 p0111 N77-12946  
 DSS-1150-31040-4-2000  
 16 p0422 A77-44481  
 E(04-3)-34  
 15 p0298 A77-36254  
 E(04-3)-167  
 13 p0093 N77-10891  
 E(04-3)-0167  
 15 p0351 N77-22968  
 15 p0393 N77-27539  
 E(04-3)-0472  
 16 p0540 N77-31672  
 E(04-3)-0701  
 15 p0381 N77-26654  
 15 p0381 N77-26655  
 E(04-3)-1038  
 15 p0365 N77-24606  
 E(04-3)-1066  
 14 p0249 N77-21685  
 E(04-3)-1068  
 14 p0158 A77-22642  
 E(04-3)-1081  
 13 p0068 A77-18448  
 15 p0372 N77-25640  
 E(04-3)-1083  
 15 p0394 N77-27549  
 E(04-3)-1093  
 14 p0252 N77-21726  
 15 p0342 N77-22432  
 15 p0342 N77-22587  
 15 p0349 N77-22683  
 15 p0349 N77-22684  
 E(04-3)-1101  
 15 p0369 N77-25011  
 16 p0514 N77-28590  
 E(04-3)-1108  
 14 p0204 A77-29592  
 16 p0433 A77-47174  
 16 p0491 A77-49101  
 14 p0231 N77-20591  
 E(04-3)-1109  
 14 p0216 N77-18571  
 E(04-3)-1110  
 16 p0484 A77-49037  
 14 p0216 N77-18570  
 14 p0248 N77-21668  
 15 p0394 N77-27550  
 15 p0394 N77-27551  
 E(04-3)-1111  
 14 p0225 N77-19649  
 14 p0230 N77-20576  
 E(04-3)-1122  
 14 p0225 N77-19648  
 E(04-3)-1124  
 16 p0456 A77-48805  
 E(04-3)-1140  
 16 p0558 N77-33657  
 E(04-3)-1185  
 16 p0492 A77-49108  
 E(04-3)-1196  
 16 p0447 A77-48737  
 E(04-3)-1202  
 16 p0408 A77-41741  
 E(04-3)-1210  
 16 p0462 A77-48847  
 16 p0468 A77-48904

E(04-3)-1285  
 15 p0258 A77-30731  
 16 p0426 A77-45303  
 E(04-3)-1286  
 15 p0257 A77-30717  
 E(10-1)-1375  
 13 p0124 N77-14605  
 14 p0211 N77-17579  
 14 p0222 N77-19607  
 14 p0223 N77-19614  
 E(11)-2616  
 16 p0534 N77-31604  
 E(11-1)-578-PA-34  
 16 p0487 A77-49070  
 E(11-1)-0578  
 14 p0225 N77-19650  
 E(11-1)-1523  
 13 p0029 A77-12747  
 E(11-1)-2331  
 13 p0042 A77-12848  
 E(11-1)-2446  
 14 p0220 N77-19584  
 E(11-1)-2501  
 16 p0537 N77-31636  
 E(11-1)-2552  
 14 p0214 N77-18352  
 E(11-1)-2558  
 14 p0222 N77-19605  
 E(11-1)-2559  
 13 p0122 N77-14593  
 E(11-1)-2577  
 14 p0248 N77-21670  
 E(11-1)-2588  
 16 p0406 A77-41587  
 16 p0477 A77-48982  
 16 p0479 A77-49001  
 16 p0480 A77-49004  
 16 p0493 A77-49118  
 E(11-1)-2590  
 13 p0004 A77-11000  
 14 p0181 A77-25906  
 16 p0405 A77-41579  
 16 p0422 A77-44484  
 16 p0460 A77-48835  
 16 p0486 A77-49058  
 E(11-1)-2591  
 14 p0187 A77-26483  
 E(11-1)-2597  
 14 p0188 A77-26506  
 15 p0395 N77-27554  
 E(11-1)-2601  
 13 p0029 A77-12747  
 E(11-1)-2602  
 14 p0210 N77-17216  
 E(11-1)-2603  
 14 p0212 N77-17582  
 E(11-1)-2604  
 14 p0189 A77-26517  
 E(11-1)-2607  
 15 p0357 N77-23626  
 E(11-1)-2608  
 16 p0417 A77-42961  
 E(11-1)-2612  
 14 p0180 A77-25782  
 E(11-1)-2613  
 16 p0468 A77-48902  
 E(11-1)-2615  
 14 p0223 N77-19613  
 E(11-1)-2616  
 16 p0467 A77-48899  
 16 p0490 A77-49093  
 16 p0521 N77-29610  
 E(11-1)-2618  
 16 p0490 A77-49092  
 E(11-1)-2621  
 13 p0043 A77-12867  
 16 p0490 A77-49094  
 14 p0222 N77-19609  
 E(11-1)-2676  
 13 p0028 A77-12737  
 E(11-1)-2683  
 13 p0039 A77-12821  
 14 p0217 N77-18579  
 14 p0229 N77-20568  
 14 p0230 N77-20569  
 14 p0230 N77-20570  
 14 p0230 N77-20571  
 14 p0230 N77-20572  
 14 p0232 N77-20603  
 15 p0383 N77-26674

E(11-1)-2687  
 14 p0215 N77-18564  
 15 p0361 N77-24571  
 E(11-1)-2688  
 14 p0224 N77-19632  
 14 p0224 N77-19633  
 14 p0224 N77-19634  
 E(11-1)-2690  
 16 p0512 N77-28495  
 E(11-1)-2693  
 14 p0222 N77-19610  
 14 p0249 N77-21683  
 E(11-1)-2698  
 14 p0224 N77-19635  
 E(11-1)-2699  
 15 p0256 A77-30318  
 13 p0087 N77-10651  
 13 p0098 N77-11538  
 E(11-1)-2703  
 16 p0475 A77-48965  
 13 p0129 N77-15498  
 E(11-1)-2704  
 14 p0250 N77-21697  
 E(11-1)-2721  
 15 p0383 N77-26670  
 E(11-1)-2727  
 15 p0357 N77-23631  
 E(11-1)-2729  
 14 p0250 N77-21689  
 E(11-1)-2732  
 14 p0250 N77-21692  
 E(11-1)-2748  
 16 p0486 A77-49057  
 E(11-1)-2749  
 15 p0390 N77-27410  
 E(11-1)-2762  
 14 p0211 N77-17570  
 E(11-1)-2769  
 16 p0522 N77-29619  
 E(11-1)-2791  
 15 p0391 N77-27509  
 E(11-1)-2824  
 13 p0036 A77-12799  
 E(11-1)-2829  
 16 p0481 A77-49019  
 E(11-1)-2854  
 14 p0188 A77-26512  
 E(11-1)-2868  
 15 p0383 N77-26676  
 E(11-1)-2876  
 16 p0497 A77-49157  
 E(11-1)-2888  
 15 p0365 N77-24609  
 E(11-1)-2895  
 14 p0231 N77-20585  
 E(11-1)-2919  
 15 p0364 N77-24600  
 E(11-1)-2934  
 15 p0383 N77-26673  
 E(11-1)-2937  
 15 p0373 N77-25648  
 E(11-1)-2982  
 15 p0377 N77-26325  
 E(11-1)-3056  
 13 p0034 A77-12789  
 13 p0043 A77-12862  
 E(11-1)-3073  
 16 p0407 A77-41698  
 15 p0342 N77-22469  
 15 p0358 N77-23942  
 15 p0376 N77-25965  
 E(11-1)-4009  
 16 p0492 A77-49104  
 E(29-1)-789  
 14 p0203 A77-29579  
 15 p0258 A77-30729  
 16 p0402 A77-41516  
 14 p0225 N77-19647  
 14 p0248 N77-21674  
 14 p0250 N77-21686  
 14 p0251 N77-21699  
 15 p0344 N77-22624  
 15 p0345 N77-22636  
 15 p0377 N77-26253  
 15 p0380 N77-26647  
 15 p0381 N77-26653  
 15 p0389 N77-27312  
 15 p0393 N77-27541  
 15 p0395 N77-27553  
 16 p0514 N77-28591  
 16 p0521 N77-29612

16 p0521 N77-29613  
 16 p0535 N77-31619  
 E(29-2)-3533  
 15 p0346 N77-22637  
 E(29-2)-3652  
 14 p0189 A77-26515  
 E(29-2)-3729  
 16 p0519 N77-29318  
 E(30-1)-16  
 15 p0333 A77-39657  
 13 p0098 N77-11539  
 14 p0223 N77-19620  
 14 p0231 N77-20583  
 14 p0231 N77-20589  
 14 p0232 N77-20594  
 14 p0232 N77-20606  
 14 p0235 N77-20931  
 14 p0236 N77-21331  
 14 p0236 N77-21332  
 14 p0250 N77-21687  
 15 p0340 N77-22263  
 15 p0344 N77-22620  
 15 p0352 N77-23012  
 15 p0364 N77-24595  
 15 p0364 N77-24596  
 15 p0364 N77-24597  
 15 p0369 N77-24729  
 15 p0369 N77-24997  
 15 p0369 N77-24998  
 15 p0369 N77-24999  
 15 p0378 N77-26595  
 15 p0386 N77-26713  
 15 p0392 N77-27521  
 16 p0541 N77-31814  
 E(34-1)-0019  
 13 p0122 N77-14595  
 E(36-2)-0058  
 13 p0130 N77-15505  
 E(38-1)-893  
 16 p0501 A77-50208  
 E(40-1)-4398  
 15 p0319 A77-38220  
 E(40-1)-4900  
 14 p0248 N77-21675  
 14 p0249 N77-21677  
 14 p0249 N77-21678  
 E(40-1)-4915  
 14 p0248 N77-21669  
 E(40-1)-4918  
 14 p0217 N77-18578  
 E(40-1)-4921  
 16 p0461 A77-48846  
 E(40-1)-4927  
 14 p0190 A77-26526  
 16 p0472 A77-48939  
 14 p0232 N77-20599  
 15 p0382 N77-26669  
 15 p0391 N77-27506  
 E(40-1)-4942  
 14 p0189 A77-26520  
 E(40-1)-4944  
 16 p0455 A77-48802  
 16 p0485 A77-49047  
 13 p0123 N77-14600  
 E(40-1)-4976  
 13 p0039 A77-12824  
 16 p0475 A77-48961  
 16 p0479 A77-49002  
 E(40-1)-5017  
 15 p0386 N77-26787  
 E(40-1)-5100  
 16 p0502 A77-50214  
 E(40-1)-5103  
 14 p0225 N77-19642  
 E(40-1)-5105  
 16 p0412 A77-42408  
 E(40-1)-5108  
 16 p0490 A77-49091  
 E(40-1)-5129  
 15 p0321 A77-38529  
 E(40-1)-5134  
 15 p0257 A77-30710  
 16 p0486 A77-49060  
 E(40-1)-5157  
 16 p0449 A77-48750  
 E(40-1)-5158  
 16 p0493 A77-49111  
 E(45-1)-1830  
 13 p0058 A77-16374  
 13 p0123 N77-14602  
 14 p0213 N77-17891

# CONTRACT NUMBER INDEX

14 p0214 N77-18448	E (49-18)-2050	16 p0461 A77-98843	EPA-68-02-1360
14 p0217 N77-18581	16 p0551 N77-33430	EG-76-05-5178	13 p0091 N77-10686
14 p0220 N77-19583	E (49-18)-2114	16 p0433 A77-47174	13 p0115 N77-13549
14 p0221 N77-19591	16 p0556 N77-33634	EG-77-C-05-5297	EPA-68-02-1361
14 p0225 N77-19643	E (49-18)-2201	15 p0346 N77-22639	16 p0440 A77-48178
14 p0249 N77-21679	13 p0130 N77-15506	EPA-ROA-TAG-B693 (78-BEG)	EPA-68-02-1405
15 p0340 N77-22291	E (49-18)-2202	13 p0054 A77-15780	16 p0560 N77-33700
15 p0345 N77-22632	16 p0442 A77-48489	EPA-1AG-D4-0391	EPA-68-02-1412
16 p0521 N77-29609	E (49-18)-2215	15 p0333 A77-39657	13 p0101 N77-11581
16 p0540 N77-31674	14 p0141 A77-21248	15 p0386 N77-26713	EPA-68-02-1482
E (45-1)-2229	15 p0326 A77-39534	EPA-1AG-D4-0569	14 p0233 N77-20608
15 p0382 N77-26664	15 p0329 A77-39555	13 p0133 N77-15540	EPA-68-02-1485
E (45-1)-2319	E (49-18)-2217	EPA-1AG-D5-0819	14 p0233 N77-20610
14 p0198 A77-28962	14 p0144 A77-21379	14 p0227 N77-19956	EPA-68-02-1729
E (46-1)-8042	E (49-18)-2219	EPA-1AG-0646	13 p0124 N77-14630
16 p0558 N77-33660	16 p0525 N77-30255	15 p0275 A77-33336	EPA-68-02-1747
E (49-1)-3800	E (49-18)-2228	EPA-R-802036	15 p0376 N77-25685
14 p0208 N77-16452	14 p0140 A77-21232	16 p0424 A77-44608	EPA-68-02-1804
15 p0348 N77-22669	E (49-18)-2234	EPA-68-01-0432	15 p0296 A77-36024
15 p0390 N77-27326	13 p0070 A77-18585	13 p0084 N77-10222	EPA-68-02-1815
16 p0559 N77-33669	E (49-18)-2253	EPA-68-01-0590	15 p0368 N77-24671
E (49-1)-3853	15 p0311 A77-37253	13 p0089 N77-10669	EPA-68-02-1821
15 p0355 N77-23607	E (49-18)-2254	13 p0089 N77-10670	15 p0368 N77-24674
15 p0355 N77-23608	15 p0328 A77-39544	EPA-68-01-1561	EPA-68-02-1831
E (49-15)-3063	E (49-18)-2294	13 p0092 N77-10719	13 p0115 N77-13551
13 p0041 A77-12838	16 p0538 N77-31650	EPA-68-01-1916	EPA-68-02-1859
E (49-18)-390	16 p0538 N77-31651	16 p0540 N77-31667	15 p0352 N77-23021
13 p0097 N77-11535	E (49-18)-2307	EPA-68-01-1957	EPA-68-02-2076
E (49-18)-1207	14 p0224 N77-19637	15 p0368 N77-24672	13 p0092 N77-10709
14 p0193 A77-27300	E (49-18)-2324	EPA-68-01-1981	EPA-68-02-2114
E (49-18)-1235	15 p0373 N77-25643	13 p0099 N77-11549	13 p0103 N77-12231
13 p0130 N77-15500	E (49-18)-2341	EPA-68-01-2440	EPA-68-02-2146
E (49-18)-1236	15 p0328 A77-39552	14 p0208 N77-16454	16 p0452 A77-48777
13 p0130 N77-15507	15 p0330 A77-39559	EPA-68-01-2476	16 p0452 A77-48779
E (49-18)-1514	E (49-18)-2365	13 p0110 N77-12576	16 p0452 A77-48780
14 p0185 A77-26459	16 p0468 A77-48901	EPA-68-01-2940	16 p0453 A77-48781
13 p0088 N77-10653	E (49-18)-2415	13 p0101 N77-11602	EPA-68-02-2147
E (49-18)-1521	14 p0135 A77-19848	EPA-68-01-2942	16 p0548 N77-32613
13 p0130 N77-15501	16 p0467 A77-48896	14 p0226 N77-19683	EPA-68-02-2315
E (49-18)-1537	E (49-18)-2453	EPA-68-01-2951	13 p0101 N77-11589
14 p0142 A77-21254	16 p0454 A77-48792	13 p0096 N77-11513	EPA-68-03-0293
E (49-18)-1552	E (49-18)-2457	EPA-68-01-2966	16 p0438 A77-47951
14 p0222 N77-19602	16 p0438 A77-47854	16 p0542 N77-32051	EPA-68-03-0295
E (49-18)-1751	E (49-18)-2469	EPA-68-01-3156	14 p0219 N77-19279
15 p0379 N77-26628	16 p0558 N77-33650	16 p0549 N77-32638	EPA-68-03-0436
15 p0379 N77-26629	E (49-18)-2476	EPA-68-01-3159	16 p0531 N77-31040
15 p0379 N77-26630	15 p0325 A77-39530	15 p0371 N77-25551	EPA-68-03-2016
15 p0379 N77-26631	E (49-18)-2477	EPA-68-01-3188	13 p0107 N77-12533
15 p0379 N77-26632	16 p0555 N77-33628	14 p0208 N77-16453	13 p0108 N77-12534
15 p0379 N77-26633	E (49-18)-2538	16 p0558 N77-33662	EPA-68-03-2172
15 p0379 N77-26634	15 p0258 A77-30721	EPA-68-01-3539	13 p0102 N77-11603
15 p0380 N77-26635	E (49-18)-2548	16 p0517 N77-28644	EPA-68-03-2176
15 p0380 N77-26636	16 p0449 A77-48753	EPA-68-02-0202	13 p0125 N77-14631
16 p0527 N77-30598	E (49-18)-1760	14 p0234 N77-20639	EPA-68-03-2198
E (49-18)-1760	13 p0034 A77-12783	EPA-68-02-0262	15 p0383 N77-26679
13 p0001 A77-10202	E (49-18)-1811	15 p0359 N77-24316	15 p0384 N77-26680
14 p0139 A77-21224	15 p0332 A77-39572	EPA-68-02-0629	15 p0384 N77-26681
14 p0141 A77-21238	E (49-26)-1004	13 p0125 N77-14638	15 p0384 N77-26682
14 p0141 A77-21250	15 p0378 N77-26613	EPA-68-02-1010	15 p0384 N77-26683
15 p0292 A77-35151	16 p0528 N77-30599	14 p0227 N77-19953	15 p0384 N77-26684
E (49-18)-1765	E (49-26)-1005	EPA-68-02-1099	15 p0384 N77-26685
13 p0120 N77-14488	16 p0555 N77-33624	14 p0209 N77-16470	15 p0384 N77-26686
13 p0127 N77-15401	E (49-26)-1022	EPA-68-02-1275	15 p0384 N77-26687
E (49-18)-1770	15 p0343 N77-22608	13 p0084 N77-10221	15 p0384 N77-26688
13 p0093 N77-10812	15 p0343 N77-22609	EPA-68-02-1307	15 p0385 N77-26689
E (49-18)-1772	15 p0378 N77-26623	15 p0350 N77-22705	15 p0385 N77-26690
13 p0088 N77-10658	15 p0379 N77-26624	EPA-68-02-1312	15 p0385 N77-26691
E (49-18)-1773	15 p0390 N77-27497	16 p0454 A77-48788	15 p0385 N77-26692
13 p0023 A77-12691	E (49-26)-1028	EPA-68-02-1318	EPA-68-03-2207
14 p0193 A77-27299	16 p0529 N77-30611	16 p0517 N77-28642	13 p0060 A77-16651
E (49-18)-1775	E (49-26)-1030	EPA-68-02-1320	EPA-68-03-2334
13 p0130 N77-15502	16 p0521 N77-29611	15 p0367 N77-24665	16 p0561 N77-34058
E (49-18)-1787	E (49-27)-1000	16 p0518 N77-28645	EPA-68-07-1719
16 p0508 A77-51587	16 p0456 A77-48809	EPA-68-02-1323	15 p0333 A77-39596
E (49-18)-1789	E (49-28)-1011	13 p0092 N77-10722	EPRI PROJ. 78-441
14 p0142 A77-21257	14 p0236 N77-21549	16 p0513 N77-28575	16 p0551 N77-33426
E (49-18)-1814	E (49-28)-1022	EPA-68-02-1324	EPRI PROJ. 334
13 p0130 N77-15503	15 p0390 N77-27496	13 p0133 N77-15550	14 p0208 N77-16449
E (49-18)-2001	EC-77-A-31-1011	13 p0133 N77-15919	EPRI PROJ. 431-1
14 p0140 A77-21231	15 p0354 N77-23487	EPA-68-02-1325	16 p0530 N77-30629
14 p0140 A77-21232	EP-76-C-01-2015	13 p0125 N77-14645	EPRI PROJ. 467
14 p0142 A77-21261	15 p0331 A77-39568	15 p0350 N77-22700	16 p0532 N77-31336
E (49-18)-2015	16 p0401 A77-41321	EPA-68-02-1329	EPRI PROJ. 506-3
15 p0331 A77-39566	EP-76-01-2243	16 p0544 N77-32579	16 p0552 N77-33512
16 p0419 A77-43593	15 p0329 A77-39558	EPA-68-02-1331	EPRI PROJ. 572-2
E (49-18)-2030	EP-77-C-01-2519	16 p0452 A77-48773	13 p0101 N77-11599
14 p0198 A77-28777	15 p0331 A77-39568	16 p0452 A77-48776	EPRI PROJ. 714-1
16 p0440 A77-48176	EP-77-C-01-2524	16 p0524 N77-29638	16 p0551 N77-33374
16 p0508 A77-51590	15 p0327 A77-39541	EPA-68-02-1359	EPRI PROJ. 731-1
E (49-18)-2031	EG-76-G-05-5178	16 p0548 N77-32615	14 p0252 N77-21727
13 p0009 A77-11244	14 p0158 A77-22645		

# CONTRACT NUMBER INDEX

EQ5AC007  
 14 p0251 N77-21706  
 EQ5AC008  
 14 p0251 N77-21706  
 EQ6AC007  
 15 p0347 N77-22659  
 ERDA EX-76-C-16-3077  
 14 p0173 A77-23916  
 ERDA WA-76-3104  
 13 p0071 A77-18790  
 ERDA 02-7996  
 15 p0267 A77-32208  
 ERDA 14-32-0001-1777  
 16 p0418 A77-43009  
 ERDA-AER-75-01039  
 15 p0380 N77-26642  
 ERDA-NSF 741222-A01  
 15 p0383 N77-26675  
 ERDA-14-01-0001-1699  
 13 p0122 N77-14594  
 ERDA-75-S-134  
 13 p0099 N77-11551  
 ESTEC-2615/76-NL-PP(SC)  
 15 p0354 N77-23175  
 EURATOM-30-74-IFUA-C  
 16 p0407 A77-41718  
 EV-76-6-06-1830  
 15 p0330 A77-39565  
 EX-C-01-2243  
 15 p0329 A77-39557  
 EX-76-C-01-1760  
 15 p0325 A77-39529  
 15 p0327 A77-39542  
 15 p0328 A77-39547  
 15 p0329 A77-39556  
 15 p0331 A77-39570  
 16 p0458 A77-48823  
 EX-76-C-01-2021  
 16 p0538 N77-31649  
 EX-76-C-01-2071  
 16 p0532 N77-31225  
 EX-76-C-01-2102  
 16 p0447 A77-48738  
 EX-76-C-01-2114  
 16 p0556 N77-33634  
 EX-76-C-01-2238  
 15 p0326 A77-39536  
 EX-76-C-01-2243  
 15 p0332 A77-39577  
 EX-76-C-01-2262  
 16 p0533 N77-31337  
 EX-76-C-01-2294  
 16 p0537 N77-31637  
 16 p0538 N77-31650  
 EX-76-C-01-2322  
 16 p0536 N77-31627  
 EX-76-C-02-3056  
 16 p0466 A77-48887  
 EX-76-C-10-3784  
 15 p0367 N77-24633  
 16 p0538 N77-31655  
 EY-76-C-02-0016  
 15 p0381 N77-26650  
 15 p0392 N77-27511  
 16 p0515 N77-28599  
 16 p0515 N77-28600  
 16 p0522 N77-29615  
 16 p0524 N77-30027  
 16 p0537 N77-31635  
 16 p0540 N77-31676  
 16 p0551 N77-33426  
 16 p0556 N77-33638  
 EY-76-C-02-0041  
 16 p0551 N77-33377  
 16 p0551 N77-33378  
 EY-76-C-02-2520  
 16 p0447 A77-48729  
 EY-76-C-02-2619  
 16 p0455 A77-48801  
 EY-76-C-02-2864  
 16 p0555 N77-33626  
 EY-76-C-02-2885  
 16 p0541 N77-31945  
 EY-76-C-02-2990  
 16 p0451 A77-48767  
 EY-76-C-02-3056  
 16 p0466 A77-48888  
 16 p0467 A77-48895  
 EY-76-C-02-4010  
 16 p0535 N77-31620

EY-76-C-03-0167  
 16 p0403 A77-41560  
 EY-76-C-03-0701  
 16 p0556 N77-33637  
 EY-76-C-03-1068  
 16 p0461 A77-48846  
 EY-76-C-03-1123  
 15 p0380 N77-26644  
 15 p0392 N77-27526  
 EY-76-C-03-1140  
 16 p0558 N77-33657  
 EY-76-C-03-1300  
 16 p0461 A77-48842  
 EY-76-C-04-0789  
 16 p0536 N77-31630  
 16 p0555 N77-33629  
 16 p0558 N77-33654  
 EY-76-C-06-1830  
 15 p0382 N77-26665  
 15 p0394 N77-27546  
 16 p0540 N77-31675  
 16 p0541 N77-31969  
 16 p0542 N77-32016  
 16 p0549 N77-32893  
 16 p0549 N77-32894  
 16 p0550 N77-32958  
 EY-76-C-07-1570  
 15 p0393 N77-27538  
 16 p0511 N77-28324  
 16 p0547 N77-32609  
 EY-76-S-02-2564  
 16 p0511 N77-28305  
 EY-76-S-02-2576  
 16 p0519 N77-29269  
 EY-76-S-02-2581  
 16 p0555 N77-33625  
 EY-76-S-02-2588  
 15 p0387 N77-27057  
 15 p0392 N77-27533  
 15 p0393 N77-27534  
 15 p0393 N77-27535  
 15 p0393 N77-27540  
 16 p0514 N77-28589  
 EY-76-S-02-2858  
 16 p0514 N77-28592  
 EY-76-S-02-2865  
 15 p0372 N77-25635  
 EY-76-S-02-2983  
 16 p0557 N77-33645  
 EY-76-S-02-4002  
 16 p0451 A77-48769  
 FE-14-32-001-1521  
 16 p0446 A77-48724  
 FEA ORDER CG-05-50083-00(1)  
 16 p0546 N77-32597  
 FEA-C-04-50041-00  
 13 p0110 N77-12587  
 FEA-C-04-50085-00  
 15 p0374 N77-25665  
 FEA-C-04-50088-00  
 13 p0091 N77-10690  
 FEA-C-05-50099-00  
 14 p0212 N77-17593  
 FEA-CA-05-50078-00  
 13 p0096 N77-11516  
 FEA-CC-04-50063-00  
 14 p0227 N77-19956  
 FEA-CG-04-75-012-0  
 16 p0529 N77-30628  
 FEA-CG-05-50083-00  
 16 p0516 N77-28611  
 FEA-CO-03-50222-00  
 13 p0096 N77-11515  
 FEA-CO-03-50222-000  
 13 p0086 N77-10633  
 FEA-CO-03-50343-00  
 16 p0517 N77-28619  
 FEA-CO-03-60466-00  
 16 p0519 N77-29326  
 FEA-CO-04-50077-00  
 15 p0359 N77-24019  
 FEA-CO-04-50135  
 15 p0361 N77-24514  
 FEA-CO-04-50224-00  
 13 p0115 N77-13542  
 13 p0115 N77-13543  
 FEA-CO-04-50247-00  
 16 p0524 N77-29636  
 16 p0524 N77-29637  
 FEA-CO-04-60431-00  
 16 p0519 N77-29026

FEA-CO-05-50152-00  
 15 p0389 N77-27316  
 FEA-CO-05-50272-00  
 15 p0375 N77-25670  
 FEA-CO-05-50293-00  
 15 p0356 N77-23618  
 FEA-CO-05-50301-00  
 16 p0516 N77-28606  
 16 p0516 N77-28607  
 16 p0519 N77-29325  
 16 p0523 N77-29630  
 FEA-CO-05-60574-00  
 13 p0121 N77-14573  
 FEA-CO-05-60575-00  
 13 p0115 N77-13553  
 FEA-CO-06-60435  
 15 p0368 N77-24667  
 FEA-CO-12-60496-00  
 13 p0091 N77-10688  
 FEA-CO-50171-00  
 13 p0108 N77-12545  
 FEA-CR-02-60857-00  
 16 p0512 N77-28569  
 FEA-CR-03-60501-00  
 15 p0374 N77-25661  
 FEA-CR-04-60918-00  
 16 p0520 N77-29598  
 FEA-CR-05-60579-00  
 13 p0113 N77-13516  
 FEA-CR-05-60593-00  
 13 p0107 N77-12531  
 13 p0107 N77-12532  
 FEA-CR-05-60704-00  
 15 p0366 N77-24622  
 FEA-P-05-76-2660-0  
 15 p0374 N77-25667  
 FWPCA-WA-11-0003  
 13 p0102 N77-11923  
 F04611-76-C-0003  
 15 p0377 N77-26491  
 F04701-75-C-0076  
 15 p0268 A77-32375  
 F30602-75-C-0122  
 16 p0522 N77-29625  
 F33615-71-C-1591  
 14 p0144 A77-21383  
 F33615-72-C-1088  
 15 p0288 A77-33710  
 13 p0111 N77-12879  
 F33615-73-C-4053  
 14 p0218 N77-18593  
 16 p0533 N77-31444  
 F33615-73-C-4059  
 13 p0127 N77-15213  
 F33615-74-C-2036  
 13 p0023 A77-12690  
 15 p0291 A77-35150  
 16 p0511 N77-28325  
 F33615-74-C-2044  
 13 p0108 N77-12539  
 F33615-75-C-2006  
 15 p0258 A77-30728  
 16 p0486 A77-49055  
 F33615-75-C-2022  
 14 p0219 N77-19278  
 F33615-75-C-2025  
 14 p0195 A77-28157  
 F33615-75-C-2045  
 16 p0553 N77-33613  
 F33615-75-C-2047  
 15 p0397 N77-27983  
 F33615-75-C-2068  
 15 p0342 N77-22408  
 F33615-76-C-0122  
 16 p0531 N77-31141  
 F33615-76-C-2001  
 15 p0326 A77-39532  
 F33615-76-C-2058  
 14 p0172 A77-23906  
 F33615-76-C-2121  
 15 p0259 A77-30738  
 F44620-76-C-0024  
 13 p0133 N77-15845  
 F49620-77-C-0023  
 16 p0525 N77-30261  
 16 p0532 N77-31334  
 16 p0550 N77-33154  
 GFW-RV-11-TO-3/72  
 14 p0212 N77-17584  
 GS-00-DS-(P)-94008  
 16 p0533 N77-31595

H-2350  
 13 p0089 N77-10673  
 HDL PROJ. A50634  
 15 p0357 N77-23635  
 HUD-H-2350  
 15 p0374 N77-25666  
 HUD-H-22026R  
 13 p0019 A77-12407  
 IGT PROJ. 8970  
 15 p0359 N77-24318  
 JPL-953913  
 13 p0118 N77-14193  
 JPL-953984  
 16 p0552 N77-33601  
 JPL-954144  
 14 p0227 N77-19898  
 14 p0227 N77-19899  
 JPL-954197  
 14 p0219 N77-19573  
 JPL-954243  
 14 p0220 N77-19575  
 JPL-954289  
 15 p0258 A77-30128  
 16 p0486 A77-49055  
 JPL-954290  
 15 p0391 N77-27502  
 JPL-954328  
 13 p0106 N77-12524  
 JPL-954405  
 15 p0391 N77-27505  
 JPL-954527  
 16 p0550 N77-33347  
 JPL-954559  
 16 p0528 N77-30606  
 JPL-954605  
 16 p0528 N77-30605  
 JPL-954606  
 15 p0362 N77-24581  
 16 p0528 N77-30604  
 JPL-954698  
 16 p0528 N77-30609  
 JPL-954800  
 16 p0528 N77-30608  
 MA-5-38054  
 13 p0116 N77-13554  
 MIPR-Z-70099-5-50352  
 16 p0468 A77-48900  
 MIT PROJ. OSP-82491  
 16 p0531 N77-31024  
 NAONR-16-76  
 15 p0387 N77-26988  
 NASA 54132-A  
 14 p0186 A77-26470  
 NASW-2558  
 13 p0104 N77-12476  
 NASW-2607  
 15 p0352 N77-23010  
 NASW-2790  
 14 p0210 N77-17562  
 15 p0388 N77-27242  
 15 p0390 N77-27474  
 16 p0531 N77-30680  
 NASW-2791  
 13 p0117 N77-13590  
 14 p0220 N77-19574  
 15 p0388 N77-27243  
 NASW-2792  
 13 p0097 N77-11528  
 NASW-2859  
 15 p0352 N77-23007  
 NASW-2920  
 14 p0227 N77-20116  
 14 p0228 N77-20560  
 14 p0229 N77-20561  
 14 p0229 N77-20562  
 NASW-2970  
 13 p0095 N77-11399  
 15 p0387 N77-27020  
 NASW-3047  
 15 p0361 N77-24561  
 NAS1-11707  
 14 p0229 N77-20564  
 NAS1-11707-86  
 16 p0406 A77-41584  
 NAS1-12812  
 15 p0257 A77-30372  
 NAS1-13395  
 15 p0279 A77-33377  
 14 p0240 N77-21611  
 NAS1-13548  
 15 p0355 N77-23603

# CONTRACT NUMBER INDEX

NAS1-13624	NAS3-19769	14 p0229 N77-20566	16 p0525 N77-30151
15 p0388 N77-27104	13 p0113 N77-13532	14 p0243 N77-21624	NAS9-15120
NAS1-13916	NAS3-19774	14 p0243 N77-21629	15 p0388 N77-27157
16 p0550 N77-33255	16 p0439 A77-48158	14 p0246 N77-21651	NAS9-15200
NAS1-14137	NAS3-19776	14 p0247 N77-21658	15 p0372 N77-25631
13 p0083 N77-10032	16 p0553 N77-33608	15 p0343 N77-22611	NCA8-00121
NAS1-14159	16 p0553 N77-33609	15 p0343 N77-22612	16 p0521 N77-29606
13 p0083 N77-10033	NAS3-19866	15 p0343 N77-22613	NCA8-00127
NAS1-14208	13 p0043 A77-12862	15 N77-22741	16 p0524 N77-29946
13 p0121 N77-14584	NAS3-19885	15 p0351 N77-22742	NERC-GR/3/2420
14 p0228 N77-20559	14 p0234 N77-20886	15 p0357 N77-23894	15 p0260 A77-31262
NAS1-14329	NAS3-20029	15 p0360 N77-24340	NGL-05-003-003
16 p0468 A77-48906	16 p0546 N77-32590	15 p0362 N77-24581	15 p0260 A77-31262
NAS2-8310	NAS3-20030	15 p0363 N77-24590	NGL-06-002-159
15 p0311 A77-37261	15 p0376 N77-26134	15 p0371 N77-25612	15 p0283 A77-33405
13 p0118 N77-14374	NAS3-20036	15 p0371 N77-25613	NGL-22-007-006
13 p0118 N77-14375	16 p0467 A77-48898	15 p0371 N77-25614	13 p0058 A77-16270
NAS2-8582	NAS3-20064	15 p0390 N77-27498	NGL-34-001-001
13 p0093 N77-11054	16 p0542 N77-32033	15 p0391 N77-27502	15 p0344 N77-22614
NAS2-8608	NAS3-20067	15 p0391 N77-27505	NGR-05-007-221
14 p0201 A77-29472	15 p0390 N77-27496	16 p0512 N77-28558	15 p0298 A77-36254
NAS2-8612	NAS3-20302	16 p0513 N77-28582	NGR-05-009-075
13 p0126 N77-15007	16 p0466 A77-48887	16 p0513 N77-28583	14 p0184 A77-26200
13 p0126 N77-15008	16 p0466 A77-48888	16 p0513 N77-28584	NGR-06-002-127
NAS2-8618	16 p0546 N77-32592	16 p0528 N77-30604	15 p0342 N77-22422
15 p0353 N77-23072	NAS5-20852	16 p0528 N77-30605	NGR-18-001-086
15 p0353 N77-23073	13 p0126 N77-14981	16 p0528 N77-30606	13 p0047 A77-13538
NAS2-8830	NAS5-20916	16 p0528 N77-30608	13 p0048 A77-13541
16 p0520 N77-29451	14 p0214 N77-18511	16 p0528 N77-30609	15 p0276 A77-33346
NAS2-9104	NAS5-21998	16 p0546 N77-32593	15 p0321 A77-38529
13 p0118 N77-14029	13 p0085 N77-10590	16 p0546 N77-32594	14 p0238 N77-21578
13 p0118 N77-14030	NAS5-22399	16 p0550 N77-33347	NGR-29-087-021
NAS2-9233	13 p0104 N77-12475	16 p0552 N77-33519	15 p0257 A77-30720
16 p0527 N77-30415	NAS5-23133	16 p0552 N77-33601	NGT-01-003-044
NAS3-15839	14 p0215 N77-18525	16 p0553 N77-33604	14 p0137 A77-20685
15 p0360 N77-24332	NAS5-23641	NAS8-21812	NGT-44-005-114
NAS3-17835	15 p0390 N77-27493	13 p0040 A77-12835	14 p0235 N77-21136
16 p0524 N77-29770	NAS5-23650	NAS8-30757	NIOSH-PROJ. R072
NAS3-18541	16 p0552 N77-33603	14 p0171 A77-23720	15 p0385 N77-26703
13 p0022 A77-12678	NAS7-100	15 p0283 A77-33404	NOAA-03-5-022-60
NAS3-18557	13 p0014 A77-11818	15 p0302 A77-36344	14 p0184 A77-26200
15 p0278 A77-33363	13 p0020 A77-12663	NAS8-31100	NOAA-04-5-158-30
NAS3-18566	13 p0029 A77-12745	15 p0312 A77-37273	14 p0215 N77-18547
13 p0129 N77-15492	13 p0031 A77-12759	NAS8-31189	NR PROJ. 099-412
NAS3-18934	13 p0032 A77-12768	14 p0210 N77-17560	16 p0518 N77-28948
13 p0035 A77-12791	13 p0036 A77-12803	NAS8-31293	NR PROJ. 347-027
15 p0277 A77-33356	13 p0037 A77-12804	15 p0378 N77-26611	16 p0531 N77-31024
14 p0238 N77-21589	13 p0037 A77-12807	NAS8-31308	NBL PROJ. C01-03A
NAS3-19128	13 p0038 A77-12813	16 p0464 A77-48872	13 p0127 N77-15121
13 p0103 N77-12182	13 p0039 A77-12819	16 p0464 A77-48875	NRL PROJ. H01-55
NAS3-19235	13 p0041 A77-12836	13 p0129 N77-15494	14 p0218 N77-18590
14 p0236 N77-21467	13 p0065 A77-18225	13 p0129 N77-15495	NSF AER-72-03426-4
14 p0236 N77-21468	13 p0070 A77-18721	13 p0129 N77-15496	15 p0262 A77-31470
NAS3-19406	14 p0173 A77-23918	NAS8-31324	NSF AER-72-03478
13 p0034 A77-12786	14 p0203 A77-29580	15 p0312 A77-37271	15 p0258 A77-30741
14 p0142 A77-21267	15 p0256 A77-30321	13 p0127 N77-15347	16 p0486 A77-49059
15 p0317 A77-37960	15 p0258 A77-30728	NAS8-31326	13 p0089 N77-10674
16 p0445 A77-48714	15 p0259 A77-30739	16 p0487 A77-49067	NSF AER-72-03478-A04
15 p0379 N77-26631	15 p0264 A77-31750	NAS8-31327	13 p0089 N77-10672
15 p0379 N77-26632	15 p0281 A77-33388	13 p0086 N77-10638	NSF AER-72-03487
15 p0379 N77-26633	15 p0281 A77-33392	NAS8-31352	15 p0288 A77-33710
15 p0379 N77-26634	15 p0284 A77-33413	13 p0040 A77-12825	NSF AER-72-03490
15 p0380 N77-26635	15 p0285 A77-33418	16 p0463 A77-48860	14 p0251 N77-21709
15 p0380 N77-26636	15 p0291 A77-35030	NAS8-31545	NSF AER-72-03490-A03
NAS3-19407	16 p0421 A77-44464	14 p0204 A77-29585	15 p0362 N77-24517
13 p0034 A77-12784	16 p0456 A77-48809	NAS8-31628	NSF AER-72-03551
15 p0303 A77-36381	16 p0461 A77-48845	14 p0199 A77-29066	14 p0215 N77-18541
15 p0379 N77-26628	16 p0462 A77-48854	14 p0207 N77-16447	15 p0343 N77-22602
15 p0379 N77-26629	16 p0465 A77-48878	NAS8-31662	15 p0347 N77-22654
15 p0379 N77-26630	16 p0466 A77-48890	15 p0378 N77-26610	NSF AER-72-03579
NAS3-19415	16 p0466 A77-48893	NAS8-31668	16 p0502 A77-50220
16 p0529 N77-30610	16 p0485 A77-49053	16 p0551 N77-33479	NSF AER-72-03579-A05
NAS3-19416	16 p0486 A77-49055	NAS8-31782	13 p0090 N77-10685
16 p0520 N77-29519	16 p0492 A77-49106	13 p0085 N77-10610	15 p0366 N77-24628
NAS3-19440	16 p0501 A77-50203	NAS8-31882	NSF AER-73-03172-A01
16 p0520 N77-29604	16 p0504 A77-51023	14 p0173 A77-23927	16 p0547 N77-32603
NAS3-19519	13 p0086 N77-10637	NAS8-32475	NSF AER-73-03197
13 p0127 N77-15043	13 p0094 N77-11198	16 p0419 A77-43392	15 p0357 N77-23624
NAS3-19586	13 p0105 N77-12509	NAS9-14319	16 p0547 N77-32604
15 p0380 N77-26637	13 p0105 N77-12513	16 p0524 N77-29770	NSF AER-73-03291
NAS3-19725	13 p0106 N77-12524	NAS9-14323	15 p0350 N77-22688
14 p0145 A77-21698	13 p0118 N77-14193	13 p0040 A77-12829	16 p0554 N77-33619
NAS3-19740	13 p0118 N77-14194	NAS9-14345	NSF AER-73-03357-A01
15 p0318 A77-38211	13 p0122 N77-14586	16 p0097 N77-11532	16 p0502 A77-50214
16 p0483 A77-49034	13 p0129 N77-15497	16 p0553 N77-33605	14 p0233 N77-20618
NAS3-19747	14 p0219 N77-19573	16 p0553 N77-33606	NSF AER-73-07199
13 p0103 N77-12230	14 p0220 N77-19575	NAS9-14958	13 p0025 A77-12108
NAS3-19767	14 p0220 N77-19579	16 p0432 A77-46885	NSF AER-73-07893
14 p0228 N77-20558	14 p0227 N77-19898	16 p0468 A77-48907	16 p0426 A77-45303
NAS3-19768	14 p0227 N77-19899	13 p0094 N77-11084	16 p0517 N77-28618
13 p0113 N77-13533	14 p0229 N77-20565	13 p0094 N77-11085	



# CONTRACT NUMBER INDEX

NSF AER-73-07950-A03  
 16 p0433 A77-47174  
 NSF AER-73-07957  
 13 p0007 A77-11110  
 13 p0090 A77-10678  
 15 p0348 A77-22672  
 NSF AER-74-23-797  
 14 p0169 A77-23558  
 NSF AER-74-00239A01  
 15 p0382 A77-26664  
 NSF AER-74-00242  
 16 p0556 A77-33636  
 NSF AER-74-01043  
 16 p0544 A77-32574  
 16 p0544 A77-32577  
 16 p0544 A77-32578  
 NSF AER-74-04014-A03  
 13 p0050 A77-14559  
 NSF AER-74-07570  
 15 p0305 A77-36556  
 NSF AER-74-08473  
 14 p0252 A77-21731  
 NSF AER-74-08566  
 14 p0233 A77-20617  
 NSF AER-74-08874  
 14 p0252 A77-21732  
 NSF AER-74-09038  
 16 p0517 A77-28620  
 NSF AER-74-09069  
 16 p0492 A77-49109  
 NSF AER-74-09186  
 13 p0090 A77-10675  
 NSF AER-74-13292  
 15 p0259 A77-30742  
 13 p0099 A77-11548  
 NSF AER-74-14718-A01  
 13 p0109 A77-12553  
 NSF AER-74-14918-A01  
 16 p0523 A77-29635  
 NSF AER-74-15532  
 15 p0374 A77-25663  
 NSF AER-74-17940-A01  
 13 p0101 A77-11577  
 NSF AER-74-18753  
 14 p0251 A77-21711  
 15 p0347 A77-22652  
 NSF AER-74-19931  
 13 p0123 A77-14603  
 NSF AER-74-20552  
 15 p0387 A77-26987  
 NSF AER-74-21867  
 14 p0194 A77-27349  
 NSF AER-74-23797  
 14 p0170 A77-23562  
 NSF AER-75-1679  
 13 p0098 A77-11547  
 14 p0251 A77-21702  
 NSF AER-75-00033  
 15 p0279 A77-33375  
 NSF AER-75-00187  
 13 p0116 A77-13556  
 16 p0516 A77-28609  
 NSF AER-75-00548  
 14 p0135 A77-19848  
 NSF AER-75-00598  
 14 p0218 A77-18667  
 NSF AER-75-00603  
 14 p0215 A77-18561  
 NSF AER-75-00647  
 13 p0044 A77-12869  
 16 p0489 A77-49087  
 16 p0492 A77-49107  
 16 p0494 A77-49128  
 15 p0357 A77-23625  
 NSF AER-75-00772  
 14 p0226 A77-19667  
 NSF AER-75-00826  
 13 p0084 A77-10271  
 13 p0115 A77-13552  
 16 p0559 A77-33667  
 NSF AER-75-07378  
 15 p0382 A77-26663  
 NSF AER-75-08793  
 14 p0194 A77-27352  
 NSF AER-75-12937  
 16 p0529 A77-30620  
 NSF AER-75-13673  
 14 p0200 A77-29450  
 13 p0096 A77-11511  
 NSF AER-75-14492  
 13 p0030 A77-12753

15 p0347 A77-22653  
 NSF AER-75-14536  
 14 p0226 A77-19708  
 14 p0234 A77-20676  
 NSF AER-75-17298  
 15 p0286 A77-33525  
 15 p0369 A77-24714  
 15 p0369 A77-24715  
 15 p0369 A77-24716  
 NSF AER-75-18362  
 15 p0366 A77-24620  
 NSF AER-75-19576  
 15 p0374 A77-25662  
 NSF AER-75-19576-A01  
 15 p0395 A77-27561  
 NSF AER-75-19712  
 13 p0109 A77-12553  
 NSF AER-75-20207  
 15 p0349 A77-22678  
 NSF AER-75-20501  
 16 p0500 A77-50050  
 14 p0217 A77-18582  
 14 p0217 A77-18583  
 NSF AER-75-000653  
 13 p0043 A77-12868  
 NSF AER-76-01823  
 14 p0212 A77-17599  
 NSF AER-76-02396  
 16 p0518 A77-29007  
 NSF AER-76-06096  
 15 p0348 A77-22670  
 NSF AER-76-09748  
 13 p0098 A77-11544  
 NSF AG-352  
 15 p0386 A77-26708  
 NSF AG-381  
 16 p0551 A77-33426  
 NSF AG-551  
 15 p0379 A77-26628  
 15 p0379 A77-26629  
 15 p0379 A77-26630  
 15 p0379 A77-26631  
 15 p0379 A77-26632  
 15 p0379 A77-26633  
 15 p0379 A77-26634  
 15 p0380 A77-26635  
 15 p0380 A77-26636  
 NSF APR-74-21034  
 13 p0018 A77-12401  
 NSF APR-75-18249  
 16 p0554 A77-33620  
 NSF APR-75-18339  
 16 p0539 A77-31663  
 16 p0554 A77-33618  
 NSF APR-75-00351  
 13 p0067 A77-18351  
 NSF BMS-75-04108  
 13 p0064 A77-17895  
 NSF C-75-22186  
 16 p0450 A77-48762  
 NSF C-76-17165  
 15 p0370 A77-25027  
 NSF C-310  
 14 p0235 A77-20972  
 15 p0358 A77-24018  
 NSF C-389  
 15 p0346 A77-22640  
 15 p0346 A77-22641  
 15 p0346 A77-22642  
 NSF C-805  
 13 p0025 A77-12708  
 NSF C-827  
 16 p0434 A77-47218  
 NSF C-839  
 15 p0346 A77-22643  
 NSF C-870  
 16 p0548 A77-32612  
 NSF C-906  
 14 p0233 A77-20616  
 NSF C-915  
 15 p0361 A77-24504  
 15 p0361 A77-24505  
 NSF C-924  
 15 p0359 A77-24318  
 NSF C-925  
 13 p0112 A77-13232  
 13 p0112 A77-13233  
 NSF C-993  
 13 p0026 A77-12722  
 NSF C-1008  
 15 p0279 A77-33375

14 p0240 A77-21609  
 NSF C-1033  
 16 p0494 A77-49123  
 NSF C-1044  
 16 p0559 A77-33674  
 NSF CHE-75-13752  
 16 p0501 A77-50208  
 NSF DMR-75-18134  
 13 p0108 A77-12538  
 NSF EN-44166  
 15 p0354 A77-23518  
 NSF ENG-73-04116-A01  
 15 p0288 A77-33710  
 16 p0425 A77-44821  
 NSF ENG-74-02918  
 15 p0373 A77-25654  
 NSF ENG-74-20444  
 16 p0500 A77-50050  
 NSF ENG-74-22564  
 15 p0319 A77-38218  
 NSF ENG-74-018062  
 13 p0031 A77-12765  
 NSF ENG-76-21419  
 16 p0439 A77-48158  
 NSF ENV-75-14492-A01  
 16 p0505 A77-51256  
 NSF ERP-73-02706  
 16 p0512 A77-28329  
 NSF ERT-74-19063  
 16 p0488 A77-49078  
 16 p0530 A77-30635  
 NSF G-6542  
 13 p0067 A77-18439  
 NSF G-8748  
 13 p0067 A77-18439  
 NSF G-13657  
 13 p0067 A77-18439  
 NSF G-17168  
 13 p0067 A77-18439  
 NSF G-19168  
 13 p0067 A77-18439  
 NSF GA-873  
 13 p0067 A77-18439  
 NSF GA-13645  
 13 p0067 A77-18439  
 NSF GA-13839  
 13 p0067 A77-18439  
 NSF GA-31324X  
 13 p0067 A77-18439  
 NSF GAER-75-00647  
 16 p0490 A77-49091  
 NSF GI-27  
 16 p0530 A77-30637  
 NSF GI-44  
 13 p0085 A77-10625  
 13 p0090 A77-10680  
 NSF GI-39436  
 16 p0471 A77-48934  
 NSF GI-27976  
 13 p0057 A77-16206  
 NSF GI-29729  
 13 p0057 A77-16206  
 NSF GI-30022  
 15 p0286 A77-33445  
 NSF GI-32724  
 13 p0098 A77-11545  
 NSF GI-32989-A2  
 15 p0386 A77-26708  
 NSF GI-34286  
 14 p0175 A77-24211  
 NSF GI-34782  
 13 p0089 A77-10672  
 NSF GI-34808  
 16 p0511 A77-28327  
 NSF GI-35683  
 14 p0169 A77-23558  
 14 p0170 A77-23562  
 NSF GI-36250  
 15 p0347 A77-22654  
 NSF GI-36338X  
 14 p0139 A77-21018  
 NSF GI-36598  
 16 p0548 A77-32614  
 NSF GI-36731  
 15 p0286 A77-33445  
 NSF GI-37905  
 15 p0351 A77-22750  
 NSF GI-38102X  
 13 p0076 A77-19087  
 NSF GI-38103  
 13 p0090 A77-10685

NSF GI-38319  
 14 p0174 A77-24205  
 14 p0252 A77-21726  
 15 p0342 A77-22432  
 15 p0342 A77-22587  
 15 p0349 A77-22683  
 15 p0349 A77-22684  
 15 p0350 A77-22685  
 15 p0356 A77-23622  
 NSF GI-38331  
 15 p0318 A77-38213  
 NSF GI-38701  
 13 p0059 A77-16475  
 NSF GI-38974  
 13 p0070 A77-18583  
 NSF GI-39114  
 14 p0231 A77-20585  
 NSF GI-39117  
 14 p0250 A77-21690  
 NSF GI-39216  
 15 p0314 A77-37665  
 NSF GI-39456  
 14 p0158 A77-22645  
 14 p0204 A77-29592  
 15 p0274 A77-33333  
 16 p0405 A77-41578  
 16 p0433 A77-47174  
 16 p0488 A77-49072  
 NSF GI-39457  
 15 p0277 A77-33361  
 14 p0238 A77-21595  
 NSF GI-39566  
 15 p0272 A77-33283  
 NSF GI-41003  
 16 p0502 A77-50214  
 NSF GI-41470  
 13 p0098 A77-11544  
 NSF GI-41891  
 14 p0234 A77-20622  
 16 p0558 A77-33652  
 NSF GI-41894  
 16 p0405 A77-41579  
 16 p0460 A77-48835  
 NSF GI-41895  
 15 p0286 A77-33445  
 NSF GI-41898  
 13 p0076 A77-19089  
 NSF GI-43090  
 13 p0108 A77-12548  
 NSF GI-43100  
 16 p0456 A77-48811  
 NSF GI-43741  
 15 p0371 A77-25623  
 15 p0378 A77-26606  
 NSF GI-43884  
 15 p0395 A77-27564  
 NSF GI-43895  
 13 p0099 A77-11551  
 NSF GI-43896  
 13 p0090 A77-10676  
 NSF GI-43897  
 14 p0188 A77-26512  
 NSF GI-44210  
 16 p0530 A77-30632  
 NSF GI-44212  
 15 p0395 A77-27564  
 NSF GI-44381  
 13 p0091 A77-10689  
 NSF GP-4193  
 13 p0067 A77-18439  
 NSF GR-39317  
 16 p0541 A77-31823  
 NSF GI-11234  
 15 p0257 A77-30714  
 NSF IOP-74-12932  
 13 p0061 A77-17014  
 NSF ISB-74-1152  
 14 p0252 A77-21728  
 NSF KO-42151  
 15 p0347 A77-22657  
 NSF HCS-76-18953  
 15 p0329 A77-39555  
 NSF HPS-75-05769  
 13 p0098 A77-11543  
 NSF ORP-74-21320  
 15 p0354 A77-23518  
 NSF ORP-75-01111  
 16 p0547 A77-32607  
 NSF ORP-75-16162  
 15 p0361 A77-24504  
 15 p0361 A77-24505

# CONTRACT NUMBER INDEX

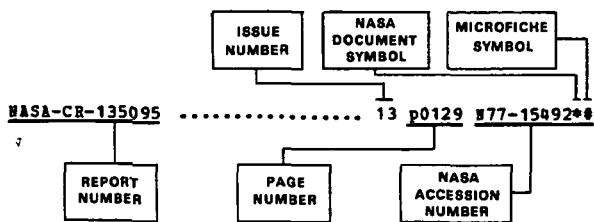
NBP OEP-75-20318	N00014-75-C-0539	13 p0113 N77-13525	14 p0219 N77-19469
16 p0523 N77-29634	13 p0052 A77-14890	13 p0113 N77-13526	14 p0221 N77-19586
NBP CIP-74-08333	N00014-75-C-0556	13 p0113 N77-13527	14 p0221 N77-19587
14 p0182 A77-26056	16 p0531 N77-31024	13 p0113 N77-13528	14 p0221 N77-19588
NBP ORDER 77-SP-0443	N00014-75-C-0865	14 p0216 N77-18566	14 p0221 N77-19589
16 p0541 N77-32009	15 p0365 N77-24619	14 p0216 N77-18568	14 p0222 N77-19612
NBP PRA-75-21960	N00014-76-C-0239	14 p0219 N77-19406	14 p0223 N77-19626
16 p0559 N77-33674	14 p0218 N77-18592	14 p0223 N77-19624	14 p0225 N77-19645
NBP PRA-76-15037	16 p0522 N77-29624	14 p0224 N77-19636	14 p0228 N77-20443
15 p0358 N77-24018	16 p0529 N77-30623	14 p0227 N77-19935	14 p0231 N77-20590
NBP PRA-76-80248	N00014-76-C-0410	14 p0231 N77-20580	14 p0231 N77-20592
16 p0547 N77-32601	16 p0518 N77-28948	14 p0249 N77-21680	14 p0232 N77-20598
NBP SE-AER-72-03579	N00014-76-C-0442	14 p0249 N77-21684	14 p0232 N77-20601
13 p0007 A77-11108	16 p0535 N77-31615	15 p0341 N77-22297	14 p0236 N77-21532
NBP SIA-72-03530	N00014-76-C-0707	15 p0344 N77-22617	14 p0246 N77-21648
15 p0385 N77-26697	16 p0551 N77-33372	15 p0344 N77-22618	14 p0246 N77-21654
NBP SIA-73-07871-A02	N00014-76-G-0041	15 p0355 N77-23609	14 p0248 N77-21671
15 p0286 A77-33496	16 p0439 A77-48158	15 p0359 N77-24265	14 p0249 N77-21681
13 p0086 N77-10626	N00017-72-C-4401	15 p0361 N77-24430	14 p0253 N77-21939
NBP SIA-74-02555-01	16 p0521 N77-29611	15 p0364 N77-24594	15 p0341 N77-22493
15 p0369 N77-24997	16 p0522 N77-29623	15 p0364 N77-24598	15 p0345 N77-22627
NBP SIA-74-17662-A02	N00024-74-C-5136	15 p0364 N77-24599	15 p0345 N77-22633
13 p0121 N77-14495	13 p0120 N77-14492	15 p0382 N77-26659	15 p0351 N77-22967
NBP SIA-74-17866	N00140-74-C-0618	15 p0386 N77-26816	15 p0352 N77-22998
14 p0179 A77-25224	16 p0533 N77-31339	15 p0388 N77-27194	15 p0355 N77-23610
15 p0367 N77-24635	N60530-76-C-0121	15 p0389 N77-27249	15 p0364 N77-24601
NBP SIA-74-18660	15 p0377 N77-26325	15 p0392 N77-27513	15 p0372 N77-25634
13 p0085 N77-10625	N62399-74-C-0029	15 p0392 N77-27520	15 p0381 N77-26651
13 p0090 N77-10680	15 p0356 N77-23614	16 p0515 N77-28603	15 p0381 N77-26652
NBP SIA-74-19080-A01	N68305-76-C-0009	16 p0529 N77-30628	15 p0382 N77-26657
13 p0060 A77-16651	16 p0554 N77-33615	16 p0532 N77-31271	15 p0386 N77-26977
NBP SIA-74-20662	OWRT PROJ. B-037-IDA(1)	16 p0536 N77-31631	15 p0387 N77-27036
14 p0137 A77-20686	16 p0539 N77-31664	16 p0538 N77-31654	15 p0387 N77-27037
NBP SIA-75-0C738	PO-WA-76-4939	16 p0542 N77-32036	15 p0392 N77-27527
16 p0539 N77-31660	15 p0387 N77-26999	16 p0557 N77-33644	15 p0394 N77-27548
NBP SIA-75-00739	PROJ. 788-1	16 p0561 N77-33968	15 p0396 N77-27651
16 p0518 N77-29001	16 p0555 N77-33622	W-7405-ENG-36	15 p0397 N77-27926
NBP SIA-75-18811	RR0120641	13 p0002 A77-10634	15 p0398 N77-28038
13 p0089 N77-10665	14 p0218 N77-18590	13 p0060 A77-16623	16 p0511 N77-28423
13 p0089 N77-10666	SRI PROJ. EGU-2836	13 p0068 A77-18441	16 p0514 N77-28593
NBP SIS-75-12766	16 p0512 N77-28329	13 p0087 N77-10650	16 p0522 N77-29616
15 p0358 N77-24002	SRI PROJ. EGU-4064	13 p0123 N77-14601	16 p0530 N77-30645
NBP SHI-76-02988	15 p0361 N77-24504	14 p0214 N77-17892	16 p0532 N77-31269
15 p0377 N77-26325	15 p0361 N77-24505	14 p0221 N77-19597	16 p0536 N77-31626
NBP SOC-75-05288	SRI PROJ. EGU-5674	14 p0221 N77-19598	16 p0536 N77-31628
15 p0335 A77-39836	16 p0518 N77-29007	14 p0227 N77-19872	16 p0557 N77-33639
NBP ST-40016000	SRI PROJ. 4000	14 p0235 N77-21325	16 p0557 N77-33640
13 p0017 A77-12234	14 p0251 N77-21706	15 p0344 N77-22623	16 p0558 N77-33655
NBP STP-75-10169	SRI PROJ. 4963-100	15 p0351 N77-22975	W-7405-ENG-82
15 p0385 N77-26698	13 p0107 N77-12528	15 p0361 N77-24431	14 p0211 N77-17567
NBP Y-910132	STU-75-3130	15 p0369 N77-25010	W-7405-ENG-92
13 p0067 A77-18439	13 p0114 N77-13539	15 p0372 N77-25639	14 p0210 N77-17246
NBP 75-14714	UMTA-RD-CA-06-0088	15 p0381 N77-26649	15 p0377 N77-26324
15 p0289 A77-34428	16 p0518 N77-29003	15 p0385 N77-26703	15 p0382 N77-26663
NBP 75-15711	USDA-12-14-7001-566	15 p0389 N77-27311	15 p0396 N77-27901
16 p0411 A77-42254	16 p0488 A77-49077	15 p0397 N77-27932	16 p0536 N77-31632
NBP 03478	V-101C-266	15 p0397 N77-27933	16 p0537 N77-31638
14 p0149 A77-21797	16 p0559 N77-33670	15 p0398 N77-27996	16 p0537 N77-31639
NSG-1186	W-31-109-ENG-38	16 p0520 N77-29455	WF57571301
13 p0117 N77-13913	14 p0216 N77-18567	16 p0533 N77-31428	13 p0103 N77-12232
NSG-1232	14 p0223 N77-19621	16 p0557 N77-33646	YF5354007
16 p0426 A77-45307	14 p0230 N77-20578	W-7405-ENG-48	14 p0210 N77-17255
NSG-2015	14 p0231 N77-20579	14 p0168 A77-23503	2F57571001
13 p0085 N77-10465	14 p0232 N77-20593	14 p0178 A77-24854	16 p0554 N77-33615
NSG-2062	15 p0345 N77-22629	15 p0284 A77-33410	311-03-41-08
15 p0265 A77-32053	15 p0345 N77-22631	15 p0284 A77-33415	16 p0532 N77-31207
16 p0400 A77-40648	15 p0365 N77-24612	15 p0306 A77-36672	386-01-00-00-72
NSG-2064	15 p0367 N77-24643	15 p0314 A77-37665	16 p0561 N77-34050
15 p0311 A77-37262	15 p0377 N77-26393	16 p0440 A77-48175	505-04
13 p0095 N77-11340	15 p0386 N77-26708	16 p0456 A77-48808	15 p0370 N77-25345
NSG-3018	15 p0393 N77-27536	16 p0457 A77-48815	505-05
15 p0257 A77-30710	15 p0394 N77-27545	16 p0469 A77-48908	15 p0353 N77-23114
16 p0486 A77-49060	15 p0394 N77-27547	16 p0482 A77-49024	505-11-16-11
14 p0215 N77-18557	15 p0396 N77-27761	16 p0482 A77-49029	15 p0370 N77-25086
N00014-67-A-0438-0015	15 p0396 N77-27922	13 p0087 N77-10652	506-23
16 p0533 N77-31495	15 p0396 N77-27923	13 p0091 N77-10697	13 p0094 N77-11175
N00014-73-C-0039	15 p0397 N77-27946	13 p0100 N77-11572	13 p0121 N77-14585
15 p0358 N77-23952	16 p0515 N77-28601	13 p0105 N77-12506	15 p0363 N77-24592
N00014-74-C-0348	16 p0524 N77-29655	13 p0106 N77-12525	506-25
13 p0089 N77-10664	16 p0532 N77-31323	13 p0123 N77-14596	14 p0213 N77-17852
N00014-75-C-0055	16 p0535 N77-31618	13 p0123 N77-14604	610-22
15 p0292 A77-35155	16 p0549 N77-32888	13 p0124 N77-14611	13 p0095 N77-11268
13 p0095 N77-11207	16 p0556 N77-33631	13 p0125 N77-14948	647-10-00-00-72
N00014-75-C-0220	16 p0556 N77-33635	13 p0129 N77-15499	13 p0126 N77-14955
13 p0033 A77-12780	16 p0557 N77-33649	13 p0131 N77-15508	776-22
14 p0218 N77-18601	W-31-109-38	13 p0132 N77-15533	15 p0363 N77-24587
N00014-75-C-0265	15 p0331 A77-39567	14 p0211 N77-17580	778-11-02
15 p0281 A77-33390	W-7405-ENG-26	14 p0212 N77-17581	16 p0534 N77-31605
14 p0243 N77-21625	13 p0060 A77-16623	14 p0215 N77-18562	778-32
N00014-75-C-0267	13 p0086 N77-10643	14 p0216 N77-18575	16 p0521 N77-29607
15 p0365 N77-24619	13 p0088 N77-10656	14 p0219 N77-19275	953-36-00-00-72
			14 p0253 N77-22005

# REPORT/ACCESSION INDEX

ENERGY / A Continuing Bibliography (Issue 16)

JANUARY 1978

## Typical Report / Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The issue and page number indicate the actual Supplement and page where the citation may be located. The accession number denotes the number by which the citation is identified. An asterisk (\*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche. A plus sign (+) indicates a document that cannot be microfiched but for which one-to-one facsimile is available.

A-4825	15	p0375	N77-25677 #
A-7162	16	p0534	N77-31605**
AAS 75-280	15	p0304	A77-36555
AAS 75-288	15	p0305	A77-36556
AAS 76-050	16	p0430	A77-46633
AAS 76-058	16	p0430	A77-46639
AD-A 023010	13	p0089	N77-10664 #
AD-A 023689	13	p0090	N77-10681 #
AD-A 023763	13	p0095	N77-11208 #
AD-A 024042	13	p0102	N77-11927 #
AD-A 024216	13	p0090	N77-10684 #
AD-A 024652	13	p0095	N77-11207 #
AD-A 024661	13	p0110	N77-12571 #
AD-A 024662	13	p0102	N77-12052 #
AD-A 024832	13	p0115	N77-13548 #
AD-A 025119	13	p0108	N77-12535 #
AD-A 025326	13	p0107	N77-12529 #
AD-A 025417	13	p0112	N77-13231 #
AD-A 025472	13	p0095	N77-11417 #
AD-A 025684	13	p0103	N77-12232 #
AD-A 025716	13	p0120	N77-14492 #
AD-A 025748	13	p0110	N77-12572 #
AD-A 025922	13	p0108	N77-12539 #
AD-A 025949	13	p0111	N77-12879 #
AD-A 026041	13	p0116	N77-13557 #
AD-A 026053	13	p0131	N77-15517 #
AD-A 026059	13	p0128	N77-15409 #
AD-A 026141	13	p0132	N77-15521 #
AD-A 026164	13	p0131	N77-15518 #
AD-A 026195	13	p0124	N77-14609 #
AD-A 026321	13	p0124	N77-14607 #
AD-A 026405	13	p0131	N77-15512 #
AD-A 026546	13	p0112	N77-13234 #
AD-A 026582	13	p0131	N77-15510 #
AD-A 026588	13	p0124	N77-14606 #
AD-A 026666	13	p0118	N77-14272 #
AD-A 026667	13	p0118	N77-14271 #
AD-A 026859	13	p0132	N77-15519 #
AD-A 026956	13	p0126	N77-14957 #
AD-A 026962	13	p0131	N77-15511 #
AD-A 026967	13	p0121	N77-14528 #
AD-A 027258	13	p0117	N77-14016 #
AD-A 027411	13	p0127	N77-15121 #
AD-A 027521	13	p0127	N77-15220 #
AD-A 027594	13	p0127	N77-15213 #
AD-A 027654	13	p0133	N77-15845 #
AD-A 028083	14	p0213	N77-17605 #
AD-A 028284	14	p0218	N77-18592 #
AD-A 028332	14	p0209	N77-16460 #
AD-A 028418	14	p0209	N77-16461 #

AD-A 029066	14	p0218	N77-18593 #
AD-A 029493	14	p0219	N77-19278 #
AD-A 029959	14	p0228	N77-20191 #
AD-A 029977	15	p0356	N77-23613 #
AD-A 030370	14	p0218	N77-18601 #
AD-A 030375	14	p0213	N77-17603 #
AD-A 030529	14	p0218	N77-18590 #
AD-A 030712	14	p0214	N77-18210 #
AD-A 030843	14	p0226	N77-19659 #
AD-A 030873	14	p0233	N77-20612 #
AD-A 031046	14	p0210	N77-17255 #
AD-A 031163	14	p0226	N77-19662 #
AD-A 031164	14	p0226	N77-19663 #
AD-A 031620	15	p0342	N77-22408 #
AD-A 031709	15	p0348	N77-22666 #
AD-A 031783	14	p0235	N77-20957 #
AD-A 031803	14	p0228	N77-20393 #
AD-A 032075	15	p0342	N77-22490 #
AD-A 032221	15	p0348	N77-22667 #
AD-A 032790	15	p0358	N77-23952 #
AD-A 032842	15	p0359	N77-24414 #
AD-A 033323	15	p0347	N77-22656 #
AD-A 033483	15	p0354	N77-23277 #
AD-A 033522	15	p0341	N77-22293 #
AD-A 033527	15	p0340	N77-22270 #
AD-A 033736	15	p0365	N77-24619 #
AD-A 033756	15	p0356	N77-24614 #
AD-A 033782	15	p0366	N77-24630 #
AD-A 034005	15	p0353	N77-23143 #
AD-A 034241	15	p0366	N77-24626 #
AD-A 034260	15	p0360	N77-24410 #
AD-A 034284	15	p0361	N77-24483 #
AD-A 034359	13	p0127	N77-15210 #
AD-A 034454	15	p0367	N77-24632 #
AD-A 034604	15	p0365	N77-24618 #
AD-A 034611	15	p0359	N77-24103 #
AD-A 034727	15	p0357	N77-23635 #
AD-A 034871	15	p0366	N77-24627 #
AD-A 034987	15	p0375	N77-25672 #
AD-A 034995	15	p0377	N77-26491 #
AD-A 035245	15	p0387	N77-26988 #
AD-A 035267	15	p0371	N77-25447 #
AD-A 035608	15	p0373	N77-25660 #
AD-A 035942	15	p0375	N77-25675 #
AD-A 036011	15	p0377	N77-26330 #
AD-A 036021	15	p0375	N77-25677 #
AD-A 036190	16	p0511	N77-28325 #
AD-A 036452	16	p0518	N77-28948 #
AD-A 036458	16	p0512	N77-28419 #
AD-A 036479	16	p0516	N77-28611 #
AD-A 036936	15	p0385	N77-26696 #
AD-A 036988	15	p0380	N77-26640 #
AD-A 037016	15	p0398	N77-28040 #
AD-A 037121	15	p0388	N77-27152 #
AD-A 037586	15	p0380	N77-26641 #
AD-A 038096	16	p0522	N77-29623 #
AD-A 038253	16	p0516	N77-28608 #
AD-A 038301	16	p0512	N77-28453 #
AD-A 038612	15	p0397	N77-27983 #
AD-A 038724	16	p0522	N77-29625 #
AD-A 038802	16	p0522	N77-29624 #
AD-A 039100	16	p0529	N77-30621 #
AD-A 039165	16	p0531	N77-31024 #
AD-A 039242	16	p0529	N77-30626 #
AD-A 039387	16	p0531	N77-30841 #
AD-A 039546	16	p0529	N77-30623 #
AD-A 039568	16	p0533	N77-31495 #
AD-A 039597	16	p0525	N77-30261 #
AD-A 039702	16	p0535	N77-31615 #
AD-A 039709	16	p0526	N77-30373 #
AD-A 039977	16	p0533	N77-31339 #
AD-A 039995	16	p0539	N77-31658 #
AD-A 040344	16	p0521	N77-29608 #
AD-A 040526	16	p0542	N77-32034 #
AD-A 040532	16	p0532	N77-31334 #

# REPORT/ACCESSION NUMBER INDEX

AD-A040589	16	p0533	N77-31444	#	AIAA PAPER 77-498	14	p0173	A77-23916	#
AD-A040736	16	p0553	N77-33612	#	AIAA PAPER 77-500	14	p0173	A77-23918*	#
AD-A040895	16	p0553	N77-33613	#	AIAA PAPER 77-505	14	p0173	A77-23922*	#
AD-A041024	16	p0530	N77-30631	#	AIAA PAPER 77-506	14	p0173	A77-23923	#
AD-A041086	16	p0554	N77-33614	#	AIAA PAPER 77-510	14	p0173	A77-23926	#
AD-A041234	16	p0531	N77-31141	#	AIAA PAPER 77-511	14	p0173	A77-23927*	#
AD-A041668	16	p0546	N77-32596	#	AIAA PAPER 77-517	14	p0174	A77-23931	#
AD-A041860	16	p0554	N77-33615	#	AIAA PAPER 77-519	14	p0174	A77-23932	#
AD-A041980	16	p0551	N77-33372	#	AIAA PAPER 77-521	14	p0174	A77-23934*	#
AD-A042112	16	p0550	N77-33154	#	AIAA PAPER 77-528	15	p0265	A77-32053*	#
AD-A042178	16	p0546	N77-32597	#	AIAA PAPER 77-529	15	p0266	A77-32054*	#
AD-A042272	16	p0554	N77-33617	#	AIAA PAPER 77-539	15	p0266	A77-32062	#
AD-A042375	16	p0560	N77-33688	#	AIAA PAPER 77-540	15	p0266	A77-32063	#
AD-A042786	16	p0547	N77-32599	#	AIAA PAPER 77-542	15	p0270	A77-32597	#
ADAPT-75-8	13	p0125	N77-14631	#	AIAA PAPER 77-543	15	p0266	A77-32065	#
ADL-C-78534-VOL-1	13	p0089	N77-10673	#	AIAA PAPER 77-552	15	p0266	A77-32069	#
ADL-C-785384-VOL-2	15	p0374	N77-25666	#	AIAA PAPER 77-726	15	p0311	A77-37251	#
ADL-78526	15	p0343	N77-22604	#	AIAA PAPER 77-727	15	p0311	A77-37252	#
ADL-760012	13	p0109	N77-12555	#	AIAA PAPER 77-728	15	p0324	A77-39506	#
AECL-5314	13	p0097	N77-11533	#	AIAA PAPER 77-729	15	p0324	A77-39507	#
AEOL-10	15	p0397	N77-27951	#	AIAA PAPER 77-730	15	p0311	A77-37253	#
AEROTHERM-FR-77-247	16	p0551	N77-33372	#	AIAA PAPER 77-747	15	p0324	A77-39512*	#
AFAPL-TR-75-10-VOL-2	16	p0511	N77-28325	#	AIAA PAPER 77-748	15	p0311	A77-37261*	#
AFAPL-TR-75-98	13	p0108	N77-12539	#	AIAA PAPER 77-749	15	p0311	A77-37262*	#
AFAPL-TR-76-7	14	p0219	N77-19278	#	AIAA PAPER 77-750	15	p0311	A77-37263	#
AFAPL-TR-76-20	13	p0112	N77-13234	#	AIAA PAPER 77-751	15	p0311	A77-37264	#
AFAPL-TR-76-21	13	p0111	N77-12879	#	AIAA PAPER 77-752	15	p0311	A77-37265	#
AFAPL-TR-76-35	14	p0218	N77-18593	#	AIAA PAPER 77-753	15	p0312	A77-37266*	#
AFAPL-TR-76-37	15	p0342	N77-22408	#	AIAA PAPER 77-760	15	p0312	A77-37271*	#
AFAPL-TR-76-71	15	p0397	N77-27983	#	AIAA PAPER 77-762	15	p0325	A77-39514*	#
AFAPL-TR-76-100	16	p0553	N77-33612	#	AIAA PAPER 77-763	15	p0312	A77-37273*	#
AFAPL-TR-76-101	16	p0522	N77-29625	#	AIAA PAPER 77-773	15	p0312	A77-37280*	#
AFAPL-TR-76-110	16	p0553	N77-33613	#	AIAA PAPER 77-776	15	p0312	A77-37281	#
AFAPL-TR-77-10	16	p0547	N77-32599	#	AIAA PAPER 77-777	15	p0312	A77-37282	#
AFCEC-TR-76-2	14	p0235	N77-20957	#	AIAA PAPER 77-778	15	p0312	A77-37283*	#
AFCEC-TR-77-11	16	p0554	N77-33614	#	AIAA PAPER 77-831	16	p0410	A77-41969	#
AFCEC-TR-77-12	16	p0546	N77-32596	#	AIAA PAPER 77-885	15	p0321	A77-38575	#
AFDDL-TR-76-96	16	p0533	N77-31444	#	AIAA PAPER 77-1001	16	p0408	A77-41855	#
AFRL-82	15	p0342	N77-22490	#	AIAA PAPER 77-1005	16	p0405	A77-41571*	#
AFRL-83	15	p0377	N77-26330	#	AIAA PAPER 77-1013	16	p0412	A77-42482	#
APOSE-76-0171TR	13	p0133	N77-15845	#	AIAA PAPER 77-1022	16	p0409	A77-41856	#
AFRPL-TR-76-66-VOL-1	15	p0377	N77-26491	#	AIAA PAPER 77-1028	16	p0419	A77-43392*	#
AGARD-CP-205	15	p0339	N77-22112	#	AIAA PAPER 77-1031	16	p0413	A77-42483	#
AI-ERDA-13176	15	p0381	N77-26655	#	AIAA PAPER 77-1255	16	p0421	A77-44343	#
AI-ERDA-13178	15	p0381	N77-26654	#	AIAA 77-372	14	p0180	A77-25782	#
AI-ERDA-13193	16	p0556	N77-33637	#	AIAA 77-573	15	p0290	A77-34933	#
AIAA PAPER 76-1064	13	p0045	A77-13030	#	AIAA 77-1004	16	p0402	A77-41552	#
AIAA PAPER 76-1068	13	p0045	A77-13033*	#	AIAA 77-1006	16	p0403	A77-41553	#
AIAA PAPER 77-109	14	p0135	A77-19833	#	AIAA 77-1007	16	p0403	A77-41554	#
AIAA PAPER 77-132	14	p0135	A77-19848	#	AIAA 77-1008	16	p0403	A77-41555	#
AIAA PAPER 77-190	14	p0135	A77-19886	#	AIAA 77-1009	16	p0403	A77-41556*	#
AIAA PAPER 77-191	14	p0135	A77-19887*	#	AIAA 77-1010	16	p0403	A77-41557	#
AIAA PAPER 77-276	13	p0065	A77-18215	#	AIAA 77-1011	16	p0403	A77-41558	#
AIAA PAPER 77-286	13	p0065	A77-18222	#	AIAA 77-1012	16	p0403	A77-41559	#
AIAA PAPER 77-289	13	p0065	A77-18223	#	AIAA 77-1016	16	p0403	A77-41560	#
AIAA PAPER 77-291	13	p0065	A77-18224	#	AIAA 77-1019	16	p0404	A77-41561	#
AIAA PAPER 77-293	13	p0065	A77-18225*	#	AIAA 77-1020	16	p0404	A77-41562	#
AIAA PAPER 77-294	13	p0065	A77-18226	#	AIAA 77-1021	16	p0404	A77-41563*	#
AIAA PAPER 77-296	13	p0066	A77-18227	#	AIAA 77-1024	16	p0404	A77-41564	#
AIAA PAPER 77-307	13	p0066	A77-18232	#	AIAA 77-1025	16	p0404	A77-41565	#
AIAA PAPER 77-312	13	p0066	A77-18237*	#	AIAA 77-1026	16	p0404	A77-41566	#
AIAA PAPER 77-346	13	p0066	A77-18254	#	AIAA 77-1027	16	p0404	A77-41567*	#
AIAA PAPER 77-352	13	p0066	A77-18257	#	AIAA 77-1032	16	p0405	A77-41569	#
AIAA PAPER 77-353	13	p0066	A77-18258*	#	AIAA 77-1034	16	p0405	A77-41570	#
AIAA PAPER 77-354	13	p0066	A77-18259	#	AIAA 77-1076	16	p0415	A77-42784*	#
AIAA PAPER 77-356	13	p0067	A77-18260	#	AIRSEARCH-75-311274B	15	p0380	N77-26644	#
AIAA PAPER 77-481	14	p0172	A77-23901	#	AIRSEARCH-76-211893	13	p0093	N77-11054*	#
AIAA PAPER 77-482	14	p0172	A77-23902	#	AIRSEARCH-76-311965	15	p0392	N77-27526	#
AIAA PAPER 77-483	14	p0172	A77-23903	#	AMRL-TR-76-50	13	p0127	N77-15213	#
AIAA PAPER 77-484	14	p0172	A77-23904	#	AHS-1297	14	p0234	N77-20622	#
AIAA PAPER 77-485	14	p0172	A77-23905	#	ANCR-1260	14	p0211	N77-17579	#
AIAA PAPER 77-486	14	p0172	A77-23906	#	ANCR-1283	13	p0124	N77-14605	#
AIAA PAPER 77-487	14	p0172	A77-23907	#	ANCR-1318	14	p0223	N77-19614	#
AIAA PAPER 77-488	14	p0173	A77-23908	#	ANCR-1319	14	p0222	N77-19607	#
					ANL-CTR-TM-40	16	p0549	N77-32888	#
					ANL-ENG-76-04	15	p0387	N77-26988	#
					ANL-RS-50	15	p0365	N77-24612	#
					ANL-RS-51	14	p0232	N77-20593	#
					ANL-RS-52	16	p0515	N77-28601	#
					ANL-RS-53	15	p0367	N77-24643	#
					ANL-RS-54	15	p0394	N77-27547	#
					ANL-RS-55	16	p0557	N77-33649	#

## REPORT/ACCESSION NUMBER INDEX

ANL-K-76-3364-1 .....	16	p0556	N77-33631 #	ASME PAPER 77-JPGC-GT-3 .....	16	p0509	A77-51623 #
ANL-K-76-3543-1 .....	16	p0556	N77-33635 #	ASME PAPER 77-JPGC-GT-7 .....	16	p0509	A77-51624 #
ANL-SOL-76-04 .....	15	p0345	N77-22629 #	ASME PAPER 77-JPGC-PWR-1 .....	16	p0508	A77-51621 #
ANL-76-XX-14 .....	15	p0386	N77-26708 #	ASR-5 .....	13	p0094	N77-10715 #
ANL-76-9 .....	14	p0223	N77-19621 #	ASRL-TR-184-2 .....	13	p0115	N77-13552 #
ANL-76-81 .....	15	p0345	N77-22631 #	ASRL-TR-184-3 .....	16	p0559	N77-33667 #
ANL-76-124 .....	16	p0532	N77-31323 #	ATR-76 (7297-01)-2 .....	14	p0227	N77-19953 #
AP-42-SUPPL-6 .....	13	p0093	N77-10731 #	ATR-76 (7467)-1 .....	13	p0121	N77-14495 #
APL/JHU-SR-76-1A .....	13	p0109	N77-12552 #	ATR-76 (7518)-7 .....	15	p0369	N77-25011 #
APL/JHU-SR-76-1B .....	13	p0116	N77-13554 #	ATR-77 (7518)-1 .....	16	p0514	N77-28590 #
APL/JHU/AEO-76-066 .....	16	p0521	N77-29611 #	B-OPR-116-76 .....	15	p0347	N77-22646 #
APL/JHU/EQB/76-4 .....	16	p0522	N77-29623 #	BAAR-9075-043-001 .....	14	p0226	N77-19683 #
AR-1 .....	13	p0105	N77-12513**	BERC/OP-76/15 .....	15		N77-22725 #
AR-1 .....	14	p0227	N77-19953 #	BERC/PPS-76/4 .....	15	p0344	N77-22626 #
AR-1 .....	16	p0511	N77-28327 #	BERC/RI-76/15 .....	15	p0389	N77-27245 #
AR-282 .....	15	p0376	N77-26247	BERC/RI-76/17-VOL-1 .....	16	p0551	N77-33377 #
ARB-R-3-929-75-48 .....	13	p0092	N77-10720 #	BERC/RI-76/17-VOL-2 .....	16	p0551	N77-33378 #
ARB-R-4-258-76-54 .....	16	p0517	N77-28628 #	BIB-74-01-VOL-1-APP-2 .....	16	p0513	N77-28577**
ARB-R-4-421-76-53 .....	15	p0348	N77-22668 #	BIB-74-01-VOL-2-APP-2 .....	16	p0513	N77-28578**
ARID LANDS RESOURCE-IP-8 .....	15	p0354	N77-23592 #	BLL-M-25448-(5828.4F) .....	13	p0112	N77-13235
ARL/MECH-ENG-148 .....	16	p0513	N77-28576 #	BLL-M-25473-(5828.4F) .....	15	p0359	N77-24245
ARO-13067.1-A-C .....	15	p0366	N77-24630 #	BLL-RTS-10351 .....	15	p0360	N77-24381
ASLE PREPRINT 77-AM-2A-1 .....	15	p0296	A77-35956	BLL-RTS-10400 .....	15	p0359	N77-24205
ASME PAPER 76-FVP-41 .....	15	p0323	A77-38825 #	BLL-SMRE-TRANS-6562-(8313.4) ...	15	p0371	N77-25485
ASME PAPER 76-WA/APC-2 .....	14	p0184	A77-26409 #	BLM/SE-77-01 .....	15	p0343	N77-22604 #
ASME PAPER 76-WA/APC-6 .....	14	p0184	A77-26411 #	BLM/SE-77-02 .....	15	p0383	N77-26677 #
ASME PAPER 76-WA/ENER-1 .....	14	p0185	A77-26430 #	BLM/SE-77-02-FT-2 .....	15	p0385	N77-26693 #
ASME PAPER 76-WA/ENER-2 .....	14	p0185	A77-26431 #	BLM/SE-77-04 .....	16	p0549	N77-32681 #
ASME PAPER 76-WA/ENER-3 .....	14	p0185	A77-26432 #	BM-IC-8704 .....	13	p0112	N77-13229 #
ASME PAPER 76-WA/FU-2 .....	14	p0185	A77-26453 #	BM-IC-8705 .....	13	p0112	N77-13230 #
ASME PAPER 76-WA/FU-6 .....	14	p0185	A77-26456 #	BM-IC-8708 .....	13	p0085	N77-10623 #
ASME PAPER 76-WA/FU-10 .....	14	p0185	A77-26457 #	BM-IC-8711 .....	13	p0085	N77-10391 #
ASME PAPER 76-WA/GT-3 .....	14	p0185	A77-26459 #	BM-IC-8717 .....	14	p0248	N77-20197 #
ASME PAPER 76-WA/HT-10 .....	14	p0186	A77-26470**	BM-IC-8719 .....	16	p0516	N77-28614 #
ASME PAPER 76-WA/HT-13 .....	14	p0186	A77-26473 #	BM-IC-8722 .....	15	p0367	N77-24636 #
ASME PAPER 76-WA/HT-14 .....	14	p0186	A77-26474 #	BM-IC-8725 .....	15	p0374	N77-25669 #
ASME PAPER 76-WA/HT-15 .....	14	p0186	A77-26475 #	BM-IC-8731 .....	16	p0533	N77-31589 #
ASME PAPER 76-WA/HT-16 .....	14	p0186	A77-26476 #	BM-IC-8732 .....	16	p0531	N77-31046 #
ASME PAPER 76-WA/HT-26 .....	14	p0186	A77-26477 #	BM-IC-8736 .....	16	p0541	N77-31824 #
ASME PAPER 76-WA/HT-27 .....	14	p0186	A77-26478 #	BM-OPR-5-77-VOL-2 .....	15	p0368	N77-24711 #
ASME PAPER 76-WA/HT-34 .....	14	p0187	A77-26481 #	BM-OPR-15-77 .....	15	p0360	N77-24371 #
ASME PAPER 76-WA/HT-36 .....	14	p0187	A77-26483 #	BM-OPR-25-77 .....	15	p0370	N77-25280 #
ASME PAPER 76-WA/HT-38 .....	14	p0187	A77-26484 #	BM-OPR-28-77 .....	15	p0372	N77-25625 #
ASME PAPER 76-WA/HT-62 .....	14	p0187	A77-26489 #	BM-OPR-36-77 .....	15	p0389	N77-27247 #
ASME PAPER 76-WA/HT-63 .....	14	p0187	A77-26490 #	BM-OPR-65-77 .....	16	p0516	N77-28613 #
ASME PAPER 76-WA/HT-68 .....	14	p0187	A77-26491 #	BM-OPR-77-76 .....	13	p0095	N77-11380 #
ASME PAPER 76-WA/HT-76 .....	14	p0187	A77-26492 #	BM-OPR-85-77 .....	16	p0525	N77-30255 #
ASME PAPER 76-WA/HT-9 .....	14	p0188	A77-26494 #	BM-OPR-117-76-VOL-1 .....	15	p0346	N77-22644 #
ASME PAPER 76-WA/HT-11 .....	14	p0188	A77-26496 #	BM-OPR-117-76-VOL-1-SUPPL .....	15	p0346	N77-22645 #
ASME PAPER 76-WA/SOL-1 .....	14	p0188	A77-26506 #	BM-OPR-121-76 .....	15	p0341	N77-22295 #
ASME PAPER 76-WA/SOL-3 .....	14	p0188	A77-26508 #	BM-OPR-128-76 .....	14	p0252	N77-21725 #
ASME PAPER 76-WA/SOL-4 .....	14	p0188	A77-26509 #	BM-RI-8141R .....	15		N77-22732 #
ASME PAPER 76-WA/SOL-6 .....	14	p0188	A77-26511 #	BM-RI-8151 .....	13	p0096	N77-11518 #
ASME PAPER 76-WA/SOL-7 .....	14	p0188	A77-26512 #	BM-RI-8173 .....	14	p0210	N77-17555 #
ASME PAPER 76-WA/SOL-8 .....	14	p0188	A77-26513 #	BM-RI-8216 .....	16	p0530	N77-30657 #
ASME PAPER 76-WA/SOL-10 .....	14	p0189	A77-26515 #	BM-RI-8217 .....	16	p0527	N77-30589 #
ASME PAPER 76-WA/SOL-11 .....	14	p0189	A77-26516 #	BM-SP-2-75 .....	13	p0085	N77-10624 #
ASME PAPER 76-WA/SOL-12 .....	14	p0189	A77-26517 #	BMFT-PB-T-76-01 .....	14	p0210	N77-17372 #
ASME PAPER 76-WA/SOL-13 .....	14	p0189	A77-26518 #	BMFT-PB-T-76-03 .....	14	p0209	N77-16467 #
ASME PAPER 76-WA/SOL-14 .....	14	p0189	A77-26519 #	BMFT-PB-T-76-25 .....	13	p0114	N77-13540 #
ASME PAPER 76-WA/SOL-15 .....	14	p0189	A77-26520 #	BMFT-PB-T-76-55 .....	14	p0209	N77-17112 #
ASME PAPER 76-WA/SOL-16 .....	14	p0189	A77-26521 #	BMFT-PB-T-76-58 .....	16	p0522	N77-29620 #
ASME PAPER 76-WA/SOL-17 .....	14	p0189	A77-26522 #	BMFT-PB-W-76-10 .....	14	p0212	N77-17584 #
ASME PAPER 76-WA/SOL-19 .....	14	p0190	A77-26524 #	BMFT-HT-145 .....	13	p0114	N77-13540 #
ASME PAPER 76-WA/SOL-21 .....	14	p0190	A77-26526 #	BMI-X-670 .....	14	p0210	N77-17246 #
ASME PAPER 76-WA/SOL-22 .....	14	p0190	A77-26527 #	BMI-X-673 .....	15	p0396	N77-27901 #
ASME PAPER 76-WA/SOL-23 .....	14	p0190	A77-26528 #	BMI-X-676 .....	16	p0536	N77-31632 #
ASME PAPER 76-WA/SOL-24 .....	14	p0190	A77-26529 #	BHVG-PBWT-76-6 .....	14	p0207	N77-16444**
ASME PAPER 76-WA/TS-1 .....	14	p0190	A77-26531 #				
ASME PAPER 77-APH-20 .....	15	p0323	A77-38837 #				
ASME PAPER 77-EB-26 .....	16	p0432	A77-46909 #				
ASME PAPER 77-ENAS-37 .....	16	p0432	A77-46878 #				
ASME PAPER 77-ENAS-44 .....	16	p0432	A77-46885**				
ASME PAPER 77-ENAS-49 .....	16	p0432	A77-46890 #				
ASME PAPER 77-GT-2 .....	14	p0197	A77-28522 #				
ASME PAPER 77-GT-4 .....	14	p0197	A77-28524 #				
ASME PAPER 77-GT-106 .....	14	p0197	A77-28616 #				

## REPORT/ACCESSION NUMBER INDEX

BNL-20865	15	p0340	N77-22263	15	p0372	N77-25636
BNL-20877	13	p0087	N77-10648	15	p0375	N77-25672
BNL-20899	13	p0085	N77-10542	13	p0087	N77-10644
BNL-20931	13	p0094	N77-11201	13	p0111	N77-13110
BNL-20990	14	p0211	N77-17577	13	p0120	N77-14486
BNL-21287	14	p0232	N77-20594	15	p0389	N77-27246
BNL-21498	15	p0344	N77-22620	13	p0088	N77-10657
BNL-21545	14	p0250	N77-21687	15	p0382	N77-26660
BNL-21546	15	p0364	N77-24596	13	p0131	N77-15509
BNL-21648	14	p0231	N77-20589	14	p0216	N77-18575
BNL-21667	14	p0235	N77-20931	16	p0549	N77-32888
BNL-21698	15	p0386	N77-26713	13	p0091	N77-10697
BNL-21780	14	p0236	N77-21331	13	p0087	N77-10646
BNL-21784	14	p0236	N77-21332	14	p0224	N77-19628
BNL-21809	15	p0378	N77-26595	14	p0222	N77-19604
BNL-21854	16	p0541	N77-31814	13	p0123	N77-14601
BNL-21918	16	p0515	N77-28599	14	p0249	N77-21677
BNL-22164	16	p0537	N77-31635	14	p0249	N77-21678
BNL-22202	16	p0551	N77-33426	14	p0248	N77-21675
BNL-22311	16	p0556	N77-33638	13	p0085	N77-10542
BNL-50493	13	p0098	N77-11539	13	p0087	N77-10648
BNL-50500	14	p0223	N77-19620	13	p0087	N77-10652
BNL-50501	16	p0522	N77-29615	14	p0219	N77-19275
BNL-50516	14	p0232	N77-20606	14	p0248	N77-21671
BNL-50532	14	p0231	N77-20583	15	p0386	N77-26787
BNL-50537	15	p0369	N77-24997	13	p0087	N77-10650
BNL-50538	15	p0369	N77-24998	14	p0230	N77-20578
BNL-50541	15	p0369	N77-24999	13	p0124	N77-14611
BNL-50555	15	p0364	N77-24597	13	p0129	N77-15498
BNL-50556	15	p0392	N77-27521	13	p0123	N77-14596
BNL-50557	15	p0369	N77-24729	13	p0129	N77-15499
BNL-50558	15	p0364	N77-24595	13	p0132	N77-15533
BNL-50559	15	p0352	N77-23012	14	p0231	N77-20579
BNL-50562	16	p0540	N77-31676	14	p0216	N77-18567
BNL-50576	15	p0392	N77-27511	15	p0344	N77-22620
BNL-50580	15	p0381	N77-26650	14	p0250	N77-21697
BNL-50590	16	p0515	N77-28600	15	p0392	N77-27519
BNL-50608	16	p0524	N77-30027	13	p0130	N77-15504
BNWL-SA-5798	14	p0220	N77-19583	14	p0211	N77-17573
BNWL-SA-5802	14	p0213	N77-17891	14	p0217	N77-18581
BNWL-SA-5808	14	p0217	N77-18581	16	p0536	N77-31633
BNWL-1942-V2	15	p0345	N77-22632	16	p0515	N77-28605
BNWL-1989	13	p0123	N77-14602	16	p0515	N77-28603
BNWL-2001	14	p0221	N77-19591	16	p0535	N77-31618
BNWL-2004-3	16	p0541	N77-31969	14	p0220	N77-19585
BNWL-2006	14	p0214	N77-18448	14	p0223	N77-19624
BNWL-2013	16	p0549	N77-32894	14	p0223	N77-19625
BNWL-2017	16	p0550	N77-32958	14	p0219	N77-19425
BNWL-2028	16	p0549	N77-32893	15	p0373	N77-25643
BNWL-2065	14	p0225	N77-19643	15	p0364	N77-24596
BNWL-2080 (RAP-4)	15	p0340	N77-22291	15	p0373	N77-25648
BNWL-2084	16	p0540	N77-31674	14	p0227	N77-19872
BNWL-2084 (RAP-5)	15	p0346	N77-22638	14	p0253	N77-21939
BNWL-2094	14	p0249	N77-21679	15	p0342	N77-22469
BNWL-2112	16	p0521	N77-29609	15	p0358	N77-23942
BNWL-2131	16	p0540	N77-31675	15	p0345	N77-22635
BNWL-2154	15	p0382	N77-26665	14	p0216	N77-18574
BNWL-2155	15	p0394	N77-27546	14	p0232	N77-20598
BNWL-2195	16	p0542	N77-32016	14	p0223	N77-19616
BRL-1895	14	p0213	N77-17605	14	p0232	N77-20599
BULL-77-2	16	p0547	N77-32605	14	p0225	N77-19650
C-781-B-VOL-2	13	p0092	N77-10709	14	p0235	N77-21325
C-1037-2-6	13	p0085	N77-10590*	14	p0236	N77-21331
CAC-214	15	p0372	N77-25635	14	p0236	N77-21332
CE-TR-205	13	p0101	N77-11577	14	p0227	N77-19935
CEER-1	16	p0540	N77-31673	14	p0225	N77-19647
CEL-TN-1450	14	p0210	N77-17255	14	p0248	N77-21674
CEH-4185-550A	14	p0226	N77-19708	15	p0394	N77-27545
CEH-4185-550B	14	p0234	N77-20676	16	p0555	N77-33628
CERL-IR-E-98	15	p0373	N77-25660	16	p0521	N77-29610
CERL-IR-E-105-VOL-2	16	p0521	N77-29608	15	p0393	N77-27535
CERL-TR-E-91	13	p0124	N77-14606	15	p0393	N77-27540
CERL-TR-E-96	15	p0356	N77-23614	15	p0392	N77-27533
CERL-TR-E-102	16	p0516	N77-28611	15	p0393	N77-27534
CERL-TR-E-114	16	p0546	N77-32597	16	p0514	N77-28589
CES-17	15	p0372	N77-25636	15	p0387	N77-27057
CGR/DC-5/76	15	p0375	N77-25672	15	p0382	N77-26657
CN-ISSN-0082-5247	13	p0087	N77-10644	15	p0396	N77-27761
CNES-NT-37	13	p0111	N77-13110	16	p0514	N77-28592
CONF-741151	13	p0120	N77-14486	14	p0221	N77-19589
CONF-750264-1	15	p0389	N77-27246	14	p0220	N77-19583
CONF-750879	13	p0088	N77-10657	14	p0232	N77-20599
CONF-750942-2	15	p0382	N77-26660	14	p0225	N77-19650
CONF-751101-77	13	p0131	N77-15509	14	p0235	N77-21325
CONF-751101-91	14	p0216	N77-18575	14	p0236	N77-21331
CONF-751125-149	16	p0549	N77-32888	14	p0236	N77-21332
CONF-751174-2	13	p0091	N77-10697	14	p0227	N77-19935
CONF-751228-P1	13	p0087	N77-10647	14	p0225	N77-19647
CONF-751228-P2	13	p0087	N77-10646	14	p0248	N77-21674
CONF-760206-3	14	p0224	N77-19628	15	p0394	N77-27545
CONF-760212-SUMH	14	p0222	N77-19604	16	p0555	N77-33628
CONF-760215-3	13	p0123	N77-14601	16	p0521	N77-29610
CONF-760222-P2	14	p0249	N77-21677	15	p0393	N77-27535
CONF-760222-P3	14	p0249	N77-21678	15	p0392	N77-27533
CONF-760222-P4	14	p0248	N77-21675	16	p0514	N77-28589
CONF-760304-9	13	p0085	N77-10542	15	p0387	N77-27057
CONF-760304-10	13	p0087	N77-10648	15	p0382	N77-26657
CONF-760304-11	13	p0087	N77-10652	15	p0396	N77-27761
CONF-760342-1	14	p0219	N77-19275	16	p0514	N77-28592
CONF-760354-1	14	p0248	N77-21671	14	p0221	N77-19589
CONF-760363	15	p0386	N77-26787	14	p0220	N77-19583
CONF-760416-1	13	p0087	N77-10650	14	p0224	N77-19636
CONF-760416-2	14	p0230	N77-20578	14	p0232	N77-20594
CONF-760423-1	13	p0124	N77-14611			
CONF-760423-2	13	p0129	N77-15498			
CONF-760443-1	13	p0123	N77-14596			
CONF-760443-2	13	p0129	N77-15499			
CONF-760450-1	13	p0132	N77-15533			
CONF-760469-3	14	p0231	N77-20579			
CONF-760472-2	14	p0216	N77-18567			
CONF-760482-1	15	p0344	N77-22620			
CONF-760488	14	p0250	N77-21697			
CONF-760495-1	15	p0392	N77-27519			
CONF-760513-5	13	p0130	N77-15504			
CONF-760536-1	14	p0211	N77-17573			
CONF-760549-1	14	p0217	N77-18581			
CONF-760595	16	p0536	N77-31633			
CONF-760597	16	p0515	N77-28605			
CONF-760602	16	p0515	N77-28603			
CONF-760617-3	16	p0535	N77-31618			
CONF-760618-1	14	p0220	N77-19585			
CONF-760618-2	14	p0223	N77-19624			
CONF-760648-1	14	p0223	N77-19625			
CONF-760650-1	14	p0219	N77-19425			
CONF-760655	15	p0373	N77-25643			
CONF-760660-1	15	p0364	N77-24596			
CONF-760677	15	p0373	N77-25648			
CONF-760723-1	14	p0227	N77-19872			
CONF-760733-4	14	p0253	N77-21939			
CONF-760733-5	15	p0342	N77-22469			
CONF-760733-6	15	p0358	N77-23942			
CONF-760816-1	15	p0345	N77-22635			
CONF-760821-1	14	p0216	N77-18574			
CONF-760821-5	14	p0232	N77-20598			
CONF-760821-7	14	p0223	N77-19616			
CONF-760821-9	14	p0232	N77-20599			
CONF-760821-11	14	p0225	N77-19650			
CONF-760829-20	14	p0235	N77-21325			
CONF-760829-27	14	p0236	N77-21331			
CONF-760829-28	14	p0236	N77-21332			
CONF-760831-2	14	p0227	N77-19935			
CONF-760832-5	14	p0225	N77-19647			
CONF-760832-12	14	p0248	N77-21674			
CONF-760832-23	15	p0394	N77-27545			
CONF-760837-P2	16	p0555	N77-33628			
CONF-760842-6	16	p0521	N77-29610			
CONF-760842-9	15	p0393	N77-27535			
CONF-760842-11	15	p0393	N77-27540			
CONF-760842-12	15	p0392	N77-27533			
CONF-760842-13	15	p0393	N77-27534			
CONF-760842-14	16	p0514	N77-28589			
CONF-760842-15	15	p0387	N77-27057			
CONF-760842-18	15	p0382	N77-26657			
CONF-760842-19	15	p0396	N77-27761			
CONF-760842-20	16	p0514	N77-28592			
CONF-760904-3	14	p0221	N77-19589			
CONF-760906-4	14	p0220	N77-19583			
CONF-760906-5	14	p0224	N77-19636			
CONF-760906-7	14	p0232	N77-20594			

# REPORT/ACCESSION NUMBER INDEX

CONF-760906-8	14	p0222	N77-19609	#	COO-2732-1	14	p0250	N77-21692	#
CONF-760906-10	14	p0221	N77-19598	#	COO-2749-15	15	p0390	N77-27410	#
CONF-760906-11	14	p0221	N77-19587	#	COO-2769-4	16	p0522	N77-29619	#
CONF-760909-2	14	p0217	N77-18576	#	COO-2791-2	15	p0391	N77-27509	#
CONF-760933-1	14	p0235	N77-20931	#	COO-2858-1	16	p0514	N77-28592	#
CONF-760935-13	15	p0351	N77-22975	#	COO-2864-1	16	p0555	N77-33626	#
CONF-760935-41	15	p0397	N77-27926	#	COO-2865-1	15	p0372	N77-25635	#
CONF-760935-43	15	p0358	N77-23951	#	COO-2868-1	15	p0383	N77-26676	#
CONF-760953-1	15	p0397	N77-27933	#	COO-2888-1	15	p0365	N77-24609	#
CONF-760989-1	16	p0541	N77-31814	#	COO-2895-T1	14	p0231	N77-20585	#
CONF-761007-1	14	p0219	N77-19406	#	COO-2934-76-1	15	p0383	N77-26673	#
CONF-761008-1	14	p0221	N77-19597	#	COO-2982-7	15	p0377	N77-26325	#
CONF-761016-6	15	p0377	N77-26325	#	COO-2983-2	16	p0557	N77-33645	#
CONF-761017-1	15	p0355	N77-23609	#	COO-4010-1	16	p0535	N77-31620	#
CONF-761018-1	14	p0225	N77-19645	#					
CONF-761030	15	p0398	N77-27996	#	CRC-APRAC-CAPE-19-70-4	13	p0092	N77-10715	#
CONF-761030-1	15	p0381	N77-26651	#					
CONF-761038-1	15	p0381	N77-26649	#	CRC-APRAC-CAPI-1-64-10	13	p0133	N77-15541	#
CONF-761057-2	16	p0519	N77-29269	#					
CONF-761103-16	15	p0386	N77-26816	#	CRC-487	13	p0133	N77-15541	#
CONF-761106-13	15	p0397	N77-27932	#					
CONF-761107-13	15	p0382	N77-26659	#	CRINC-2620-01	15	p0347	N77-22657	#
CONF-761107-17	15	p0382	N77-26668	#					
CONF-761107-23	15	p0397	N77-27946	#	CRREL-SR-76-5	13	p0126	N77-14957	#
CONF-761109-5	15	p0386	N77-26713	#	CRREL-SR-77-11	16	p0530	N77-30631	#
CONF-761122-1	15	p0378	N77-26595	#					
CONF-761129	15	p0381	N77-26653	#	CRREL-TL-534	13	p0121	N77-14528	#
CONF-761130-1	15	p0380	N77-26647	#	CRREL-TL-568	16	p0516	N77-28608	#
CONF-761130-3	15	p0381	N77-26652	#	CRREL-TL-576	16	p0512	N77-28453	#
CONF-761135-1	15	p0393	N77-27541	#					
CONF-761143-1	15	p0382	N77-26669	#	CRREL-76-33-PT-4	14	p0248	N77-20393	#
CONF-770301-5	16	p0532	N77-31271	#					
CONF-770505-1	16	p0549	N77-32895	#	CTI-IV-75-01449	14	p0235	N77-21204	#
CONF-770505-79	16	p0555	N77-33630	#					
CONF-770505-254	16	p0560	N77-33681	#	CTS-75-21	13	p0110	N77-12576	#
CONF-770505-269	16	p0560	N77-33678	#					
CONF-770505-272	16	p0560	N77-33677	#	CW-WR-76-028.2	15	p0376	N77-26134**	
CONF-770505-331	16	p0548	N77-32619	#					
CONF-770505-339	16	p0560	N77-33680	#	DARCOM-ITC-02-08-76-203	13	p0108	N77-12535	#
CONF-960935-7	15	p0351	N77-22967	#					
CONF-7605511	14	p0250	N77-21688	#	DDC-TAS-73-51	16	p0529	N77-30621	#
CONF-7606128-1	15	p0393	N77-27536	#	DDC/BIB-76/04	16	p0529	N77-30621	#
CONS-3800-1CAR-2	15	p0390	N77-27326	#	DES-76-9	15	p0362	N77-24572	#
CONS-9416-1	16	p0520	N77-29519**		DES-77-3	15	p0393	N77-27542	#
CONS/NSF/42-1	16	p0556	N77-33636	#	DGLR PAPER 76-182	13	p0059	A77-16533	#
CONS/2050-1-VOL-3-APP	16	p0551	N77-33430	#	DGLR PAPER 76-188	13	p0059	A77-16534	#
CONS/2114-3	16	p0556	N77-33634	#	DGLR PAPER 76-189	13	p0059	A77-16551	#
					DGLR PAPER 76-192	13	p0060	A77-16557	#
					DGLR PAPER 76-198	13	p0060	A77-16575	#
CONTRIB-291	15	p0347	N77-22654	#					
					DIBA/EAD-77/1	16	p0523	N77-29633	#
COO-0019-5	13	p0122	N77-14595	#					
COO-2446-7	14	p0220	N77-19584	#	DLR-FB-76-32	13	p0114	N77-13541	#
COO-2552-6	14	p0214	N77-18352	#	DLR-FB-76-32	14	p0251	N77-21701	#
COO-2558-1	14	p0222	N77-19605	#	DLR-FB-76-55	14	p0233	N77-20607	#
COO-2559-1	13	p0122	N77-14593	#	DLR-FB-76-55	15	p0365	N77-24615	#
COO-2564-2	16	p0511	N77-28305	#					
COO-2576-3	16	p0519	N77-29269	#	DLR-IB-553-75/1	13	p0091	N77-10700	#
COO-2577-10	14	p0248	N77-21670	#					
COO-2581-3	16	p0555	N77-33625	#	DM-16	13	p0114	N77-13539	#
COO-2597-2	15	p0395	N77-27554	#					
COO-2602-2	14	p0210	N77-17216	#	DME-MD-53	13	p0124	N77-14609	#
COO-2603-1	14	p0212	N77-17582	#					
COO-2607-2	15	p0357	N77-23626	#	DOC-76SDS4225	13	p0113	N77-13532**	
COO-2615-76-T-1	14	p0223	N77-19613	#					
COO-2683-76-1	14	p0232	N77-20603	#	DOI-OMPRA-76/02	14	p0245	N77-19657	#
COO-2683-76-3	14	p0229	N77-20568	#	DOI-OMPRA-76/03	14	p0225	N77-19658	#
COO-2683-76-5	14	p0230	N77-20569	#					
COO-2683-76-7	14	p0217	N77-18579	#	DOI/OMPRA/CL-76/01-PT-1	13	p0110	N77-12592	#
COO-2683-76-8	14	p0230	N77-20570	#					
COO-2683-76-9	14	p0230	N77-20571	#	DOT-TPI-10-77-11	15	p0398	N77-28046	#
COO-2683-76-10	14	p0230	N77-20572	#					
COO-2683-76-11	15	p0383	N77-26674	#	DOT-TSC-OST-76-27	15	p0354	N77-23507	#
COO-2687-4	14	p0215	N77-18564	#	DOT-TSC-OST-76-30	16	p0559	N77-33672	#
COO-2687-5	15	p0361	N77-24571	#	DOT-TSC-OST-76-43	15		N77-22725	#
COO-2688-76-6-VOL-1	14	p0224	N77-19632	#					
COO-2688-76-6-VOL-2	14	p0224	N77-19633	#	DOT-TST-76-57-1	13	p0133	N77-15930	#
COO-2688-76-6-VOL-3	14	p0224	N77-19634	#	DOT-TST-76-57-2	13	p0108	N77-12536	#
COO-2690-1	16	p0512	N77-28495	#	DOT-TST-76-69.1	13	p0117	N77-13922	#
COO-2693-76-1	14	p0249	N77-21683	#	DOT-TST-76-82	13	p0125	N77-14939	#
COO-2693-76-2	14	p0222	N77-19610	#					
COO-2698-1	14	p0224	N77-19635	#	DREO-TN-76-15	15	p0356	N77-23613	#
COO-2699-2	13	p0087	N77-10651	#					
COO-2699-3	13	p0098	N77-11538	#	DRI-9/76	15	p0352	N77-23010**	
COO-2703-2	13	p0129	N77-15498	#					
COO-2704-3	14	p0250	N77-21697	#	DSD-9	16	p0511	N77-28327	#
COO-2721-76-1	15	p0383	N77-26670	#					
COO-2727-4	15	p0357	N77-23631	#					

# REPORT/ACCESSION NUMBER INDEX

DSR/1005-1	16	p0555	N77-33624 #	EMD-77-31	16	p0559	N77-33671 #
DSR/2071-1	16	p0532	N77-31225 #	EPA-R8-TS-5	14	p0208	N77-16457 #
DSR/2322-1	15	p0363	N77-24588 #	EPA-330/2-76-025	13	p0116	N77-13566 #
DSR/2322-1-SUPPL	16	p0536	N77-31627 #	EPA-330/3-75-001	13	p0104	N77-12486**
DSR/3729-1	16	p0519	N77-29318 #	EPA-340/2-76-001	15	p0368	N77-24672 #
DSR/4691-76/1	16	p0522	N77-29614 #	EPA-450/2-76-004	13	p0083	N77-10220 #
DST-1850S-403-77	16	p0542	N77-32034 #	EPA-450/2-76-016-A-VOL-1	14	p0213	N77-17647 #
DST-1850S-403A-75	16	p0512	N77-28419 #	EPA-450/3-76-001	16	p0560	N77-33700 #
DTH-77-2	16	p0527	N77-30415**	EPA-450/3-76-012-B-VOL-2	13	p0092	N77-10709 #
DTNRDC-SPD-332-03	13	p0127	N77-15220 #	EPA-450/3-76-036	15	p0371	N77-25551 #
D6-75775	13	p0083	N77-10033**	EPA-460/3-76-014	13	p0102	N77-11603 #
D6-75780	13	p0118	N77-14029**	EPA-530/SW-122C.2	16	p0542	N77-32051 #
D6-75780	13	p0118	N77-14030**	EPA-600/2-75-048	13	p0084	N77-10221 #
D210-10965-1	13	p0102	N77-12052 #	EPA-600/2-76-057	13	p0115	N77-13551 #
D277-10025-1	14	p0225	N77-19649 #	EPA-600/2-76-061-A-VOL-1	14	p0234	N77-20639 #
E-8076	13	p0086	N77-10640**	EPA-600/2-76-090	14	p0233	N77-20610 #
E-8174	13	p0094	N77-11175**	EPA-600/2-76-093-A	15	p0352	N77-23021 #
E-8596	16	p0527	N77-30598**	EPA-600/2-76-093-B	13	p0101	N77-11581 #
E-8715	13	p0127	N77-15208**	EPA-600/2-76-098-A-VOL-1	13	p0091	N77-10686 #
E-8822	15	p0363	N77-24592**	EPA-600/2-76-098-B-VOL-2	13	p0115	N77-13549 #
E-8828	14	p0213	N77-17852**	EPA-600/2-76-101	13	p0125	N77-14638 #
E-8832	13	p0095	N77-11268**	EPA-600/2-76-127	13	p0110	N77-12581 #
E-8879	13	p0083	N77-10116**	EPA-600/2-76-130	13	p0092	N77-10722 #
E-8884	13	p0086	N77-10642**	EPA-600/2-76-136-A-VOL-1	13	p0110	N77-12597 #
E-8885	13	p0105	N77-12517**	EPA-600/2-76-148	14	p0219	N77-19279 #
E-8894	13	p0105	N77-12518**	EPA-600/2-76-149	13	p0125	N77-14645 #
E-8896	13	p0097	N77-11529**	EPA-600/2-76-152-A	13	p0116	N77-13569 #
E-8915	13	p0121	N77-14585**	EPA-600/2-76-152-B	13	p0116	N77-13570 #
E-8929	14	p0207	N77-16445**	EPA-600/2-76-152-C-VOL-3	13	p0125	N77-14643 #
E-8932	13	p0097	N77-11530**	EPA-600/2-76-153	14	p0209	N77-16470 #
E-8956	13	p0106	N77-12519**	EPA-600/2-76-177-A-VOL-1	13	p0103	N77-12231 #
E-8975	13	p0104	N77-12406**	EPA-600/2-76-182	13	p0133	N77-15540 #
E-8982	13	p0128	N77-15487**	EPA-600/2-76-208	13	p0133	N77-15919 #
E-8983	13	p0106	N77-12520**	EPA-600/2-76-209	13	p0133	N77-15550 #
E-8984	13	p0114	N77-13534**	EPA-600/2-76-248	16	p0548	N77-32615 #
E-8985	13	p0106	N77-12521**	EPA-600/2-76-259	15	p0350	N77-22705 #
E-8991	13	p0114	N77-13535**	EPA-600/2-76-284	15	p0368	N77-24671 #
E-8996	13	p0111	N77-13064**	EPA-600/2-76-289	16	p0531	N77-31040**
E-9001	13	p0114	N77-13536**	EPA-600/2-77-001	16	p0518	N77-28645 #
E-9006	13	p0106	N77-12522**	EPA-600/2-77-008-A	15	p0359	N77-24316 #
E-9007	13	p0106	N77-12523**	EPA-600/2-77-067	16	p0517	N77-28642 #
E-9008	15	p0353	N77-23109**	EPA-600/3-76-034	13	p0125	N77-14631 #
E-9036	15	p0363	N77-24587**	EPA-600/4-76-056	15	p0376	N77-25685 #
E-9043	13	p0126	N77-15037**	EPA-600/4-77-007	16	p0543	N77-32277 #
E-9066	14	p0229	N77-20563**	EPA-600/7-76-001	13	p0099	N77-11549 #
E-9070	15	p0370	N77-25345**	EPA-600/7-76-002	14	p0208	N77-16453 #
E-9075	14	p0214	N77-17947**	EPA-600/7-76-008-A	13	p0107	N77-12533 #
E-9096	14	p0220	N77-19580**	EPA-600/7-76-008-B	13	p0108	N77-12534 #
E-9103	16	p0521	N77-29607**	EPA-600/7-76-014	14	p0226	N77-19683 #
E-9105	15	p0353	N77-23114**	EPA-600/7-76-018	14	p0227	N77-19953 #
E-9112	15	p0357	N77-23936**	EPA-600/7-76-022	15	p0368	N77-24674 #
E-9131	15	p0354	N77-23487**	EPA-600/7-76-028	15	p0367	N77-24665 #
E-9140	14	p0236	N77-21549**	EPA-600/7-76-033	15	p0350	N77-22700 #
E-9142	15	p0343	N77-22608**	EPA-600/7-76-034-B-VOL-2	15	p0383	N77-26679 #
E-9147	15	p0343	N77-22609**	EPA-600/7-76-034-C-VOL-3	15	p0384	N77-26680 #
E-9148	15	p0376	N77-26222**	EPA-600/7-76-034-D-VOL-4	15	p0384	N77-26681 #
E-9150	16	p0535	N77-31612**	EPA-600/7-76-034-E-VOL-5	15	p0384	N77-26682 #
E-9163	15	p0354	N77-23490**	EPA-600/7-76-034-F-VOL-6	15	p0384	N77-26683 #
E-9194	15	p0378	N77-26613**	EPA-600/7-76-034-G-VOL-7	15	p0384	N77-26684 #
E-9217	16	p0526	N77-30314**	EPA-600/7-76-034-H-VOL-8	15	p0384	N77-26685 #
E-9241	15	p0390	N77-27497**	EPA-600/7-76-034-I-VOL-9	15	p0384	N77-26686 #
E-9242	16	p0528	N77-30599**	EPA-600/7-76-034-J-VOL-10	15	p0384	N77-26687 #
E-9266	16	p0529	N77-30611**	EPA-600/7-76-034-K-VOL-11	15	p0384	N77-26688 #
E-9313	16	p0535	N77-31614**	EPA-600/7-76-034-L-VOL-12	15	p0385	N77-26689 #
ECON-76-1301-1	15	p0371	N77-25447 #	EPA-600/7-76-034-M-VOL-13	15	p0385	N77-26690 #
ECON-4351	13	p0132	N77-15519 #	EPA-600/7-76-034-N-VOL-14	15	p0385	N77-26691 #
ECON-4457	15	p0375	N77-25675 #	EPA-600/7-76-034-O-VOL-15	15	p0385	N77-26692 #
ECON-4494	16	p0526	N77-30373 #	EPA-600/7-76-035	16	p0513	N77-28575 #
ECON-4495	16	p0539	N77-31658 #	EPA-600/7-77-013	16	p0517	N77-28644 #
EDR-9068	16	p0542	N77-32033**	EPA-600/7-77-024	16	p0523	N77-29632 #
EBA/S-76/489	15	p0362	N77-24572 #	EPA-600/7-77-035	16	p0524	N77-29638 #
EF76-18R	16	p0517	N77-28628 #	EPA-600/7-77-037	16	p0540	N77-31667 #
EHL-H-76H-2	13	p0110	N77-12571 #	EPA-600/7-77-039	16	p0544	N77-32579 #
EIR-77/1	16	p0548	N77-32614 #	EPA-600/7-77-045	16	p0548	N77-32613 #
EL-CR-77.013	16	p0554	N77-33615 #	EPA-600/7-77-051	16	p0561	N77-34058 #
				EPA-600/9-76-020	14	p0233	N77-20608 #
				EPA-600/9-76-022	13	p0101	N77-11602 #
				EPA-690/9-76-011	14	p0207	N77-16433 #
				EPA-901/9-76-006	13	p0092	N77-10719 #
				EPA-908/4-77-001	16	p0540	N77-31725 #
				EPA/SW-123C	13	p0096	N77-11513 #
				EPRI-AF-182	13	p0089	N77-10667 #
				EPRI-AF-202	14	p0212	N77-17594 #
				EPRI-AF-219	13	p0093	N77-10974 #



## REPORT/ACCESSION NUMBER INDEX

EPRI-AP-233	15	p0350	N77-22687 #	ERDA-77-20/1	16	p0537	N77-31637 #
EPRI-AP-233	16	p0551	N77-33374 #	ERDA-77-20/2	16	p0538	N77-31650 #
EPRI-EA-201	16	p0539	N77-31656 #	ERDA-77-20/3	16	p0538	N77-31651 #
EPRI-EA-221-VOL-2	14	p0251	N77-21718 #	ERDA-77-57	16	p0557	N77-33648 #
EPRI-EA-235-VCL-1	16	p0530	N77-30629 #	ERDA/JPL-1012-76/6	13	p0086	N77-10637**
EPRI-EA-298	15	p0349	N77-22679 #	ERDA/JPL-954144-76/01	14	p0227	N77-19899**
EPRI-EA-318-SR	16	p0536	N77-31633 #	ERDA/JPL-954328-76/4	13	p0106	N77-12524**
EPRI-EC-144	13	p0101	N77-11599 #	ERDA/JPL-954356-76/2	13	p0105	N77-12513**
EPRI-EM-226	15	p0341	N77-22398 #	ERDA/JPL-954405-77/4	15	p0391	N77-27505**
EPRI-EM-230	14	p0208	N77-16456 #	ERDA/JPL-954527-77/2	16	p0550	N77-33347**
EPRI-EM-249	14	p0236	N77-21356 #	ERDA/JPL-954559-77/2	16	p0528	N77-30606**
EPRI-EM-256-SY	16	p0555	N77-33622 #	ERDA/JPL-954605-77/2	16	p0528	N77-30605**
EPRI-EM-259	14	p0252	N77-21727 #	ERDA/JPL-954606-77/1	15	p0362	N77-24581**
EPRI-EM-264-VCL-3	16	p0537	N77-31636 #	ERDA/JPL-954606-77/1	16	p0528	N77-30608**
EPRI-EM-266	15	p0391	N77-27510 #	ERDA/JPL-954698-77/1	16	p0528	N77-30609**
EPRI-EM-287	16	p0532	N77-31336 #	ERDA/JPL-954800-77/1	16	p0528	N77-30608**
EPRI-EM-313-SR-VOL-1	14	p0230	N77-20577 #	ERDA/NASA-0067/77/1	15	p0390	N77-27496**
EPRI-EM-335	15	p0391	N77-27508 #	ERDA/NASA-1004/77/1	15	p0378	N77-26613**
EPRI-EM-336	15	p0392	N77-27516 #	ERDA/NASA-1004/77/2	16	p0528	N77-30599**
EPRI-EM-384	16	p0557	N77-33643 #	ERDA/NASA-1011/77/2	15	p0354	N77-23487**
EPRI-ER-188	13	p0109	N77-12551 #	ERDA/NASA-1022/76/6	15	p0378	N77-26623**
EPRI-ER-198	14	p0208	N77-16459 #	ERDA/NASA-1022/76/7	15	p0379	N77-26624**
EPRI-ER-203	14	p0234	N77-20880 #	ERDA/NASA-1022/77/11	15	p0343	N77-22608**
EPRI-ER-248	14	p0234	N77-20879 #	ERDA/NASA-1022/77/12	15	p0343	N77-22609**
EPRI-ER-283-SR-VOL-1	14	p0252	N77-21721 #	ERDA/NASA-1022/77/15	15	p0390	N77-27497**
EPRI-ER-283-SR-VOL-2	14	p0252	N77-21722 #	ERDA/NASA-1028/77/1	16	p0529	N77-30611**
EPRI-ER-299	15	p0349	N77-22680 #	ERDA/NASA-1028/77/3	16	p0535	N77-31614**
EPRI-ER-301	14	p0251	N77-21712 #	ERDA/NASA-19768	13	p0113	N77-13533**
EPRI-ER-321-SR	16	p0515	N77-28598 #	ERDA/NASA/3-20064/77/1	16	p0542	N77-32033**
EPRI-ES-115-VOL-1	13	p0088	N77-10662 #	ERDA/NSF-00357/76/1	15	p0351	N77-22775 #
EPRI-ES-115-VOL-2	13	p0089	N77-10663 #	ERDA/NSF-00598/75/T1	14	p0218	N77-18667 #
EPRI-ES-187	14	p0208	N77-16449 #	ERDA/NSF-00603/75/T1	14	p0215	N77-18561 #
EPRI-FP-164	13	p0100	N77-11563 #	ERDA/NSF-00826-75/3	16	p0559	N77-33667 #
EPRI-FP-165	13	p0109	N77-12568 #	ERDA/NSF-00826/75/2	13	p0115	N77-13552 #
EPRI-NP-334	16	p0552	N77-33512 #	ERDA/NSF-07378/75/1	15	p0382	N77-26663 #
EPRI-SR-39	13	p0092	N77-10707 #	ERDA/SE/GI-43896/ER/75/10	13	p0090	N77-10676 #
EPRI-SR-45	13	p0100	N77-11561 #	ERG-76-04	13	p0122	N77-14592 #
EPRI-SR-46	13	p0132	N77-15528 #	ESA-CR (P)-911-VOL-1	15	p0354	N77-23175 #
EPRI-TPS-75-611	14	p0208	N77-16459 #	ESA-SP-112-VOL-2	13	p0119	N77-14378 #
EPRI-223-1-FR	13	p0092	N77-10717 #	ESA-TT-338	14	p0251	N77-21701 #
EPRI-1235-2A	13	p0110	N77-12598 #	ESA-TT-365	15	p0365	N77-24615 #
EPRI-1235-3-FR	14	p0212	N77-17595 #	EUR-CEA-FC-839-TR	16	p0541	N77-31981 #
EQ-517613007	15	p0347	N77-22659 #	EUR-5516	16	p0549	N77-32914 #
ERC-0123-3	15	p0380	N77-26640 #	EXXON/GRU.1BH-77-VOL-1	16	p0553	N77-33608**
ERC-7396-S	13	p0090	N77-10684 #	EXXON/GRU.2BH.77-VOL-2	16	p0553	N77-33609**
ERC-7396-S-3	14	p0213	N77-17603 #	EXXON/GRU.2DIBA.75/715520	13	p0115	N77-13551 #
ERC-7396-4	15	p0380	N77-26641 #	EXXON/GRU.2FEA.76-VOL-2	16	p0511	N77-28325 #
ERDA-SNS-3063-8	13	p0094	N77-11108 #	EXXON/GRU.16DJ.76	13	p0125	N77-14638 #
ERDA-TR-143	14	p0230	N77-20575 #	EXXON/GRU.18GAP.77	16	p0533	N77-31339 #
ERDA-TR-144	14	p0216	N77-18572 #	E77-10007	13	p0085	N77-10590**
ERDA-TR-158	14	p0226	N77-19782 #	E77-10028	13	p0096	N77-11491**
ERDA-TR-225	15	p0386	N77-26916 #	E77-10045	13	p0104	N77-12475**
ERDA-TR-226	15	p0391	N77-27507 #	E77-10090	14	p0214	N77-18511**
ERDA-23A	13	p0098	N77-11540 #	E77-10111	14	p0215	N77-18525**
ERDA-76-1-PM-3	16	p0515	N77-28605 #	F-C4362	16	p0555	N77-33626 #
ERDA-76-1-VOL-2	14	p0222	N77-19600 #	FCR-0237	15	p0380	N77-26637**
ERDA-76-6	16	p0515	N77-28604 #	FE-0390-1	13	p0097	N77-11535 #
ERDA-76-54	13	p0123	N77-14597 #	FE-1235-1	13	p0130	N77-15500 #
ERDA-76-63	14	p0222	N77-19611 #	FE-1236-4	13	p0130	N77-15507 #
ERDA-76-65	14	p0249	N77-21685 #	FE-1514-176	13	p0088	N77-10653 #
ERDA-76-69	13	p0130	N77-15506 #	FE-1521-13	13	p0130	N77-15501 #
ERDA-76-74	14	p0213	N77-17872 #	FE-1552-18	14	p0222	N77-19602 #
ERDA-76-77	14	p0213	N77-17883 #	FE-1765-7	13	p0127	N77-15401 #
ERDA-76-81	14	p0230	N77-20573 #	FE-1765-8	13	p0120	N77-14488 #
ERDA-76-109	14	p0222	N77-19602 #	FE-1770-4	13	p0093	N77-10812 #
ERDA-76-127	15	p0346	N77-22639 #	FE-1772-11	13	p0088	N77-10658 #
ERDA-76-131/1	15	p0355	N77-23607 #	FE-1775-3	13	p0130	N77-15502 #
ERDA-76-131/2	15	p0355	N77-23608 #	FE-1814-2	13	p0130	N77-15503 #
ERDA-76-138	15	p0344	N77-22621 #	FE-2021-4	16	p0538	N77-31649 #
ERDA-76-144	16	p0514	N77-28597 #	FE-2201-4	13	p0130	N77-15506 #
ERDA-76-160	15	p0387	N77-26999 #	FE-2262-3	16	p0533	N77-31337 #
ERDA-76-161	16	p0538	N77-31653 #	FE-2307-2	14	p0224	N77-19637 #
ERDA-77-13	16	p0514	N77-28596 #	FE-2469-3	16	p0558	N77-33650 #
ERDA-77-15/1-VOL-1	16	p0536	N77-31629 #	FEA/B-76/028	13	p0111	N77-12930 #
				FEA/B-76/218	13	p0099	N77-11553 #
				FEA/B-76/219	13	p0093	N77-10941 #

# REPORT/ACCESSION NUMBER INDEX

FEA/B-76/221	13	p0086	N77-10633	#	FEA/T-77/019	15	p0347	N77-22650	#
FEA/B-76/281	13	p0084	N77-10224	#	FEA/T-77/033	15	p0374	N77-25668	#
FEA/B-76/307	13	p0108	N77-12540	#	FEA/T-77/177	16	p0530	N77-30633	#
FEA/B-76/308	15	p0360	N77-24321	#					
FEA/B-76/317	13	p0096	N77-11515	#	FES-76/1	13	p0096	N77-11509	#
FEA/B-76/335	13	p0124	N77-14608	#	FES-76/2-VOL-1	15	p0349	N77-22675	#
FEA/B-76/351	14	p0208	N77-16450	#	FES-76/2-VOL-2	15	p0349	N77-22676	#
FEA/B-76/352	15	p0341	N77-22292	#	FES-76/77-4	15	p0362	N77-24580	#
FEA/B-76/384	14	p0218	N77-18596	#	FES-76/77-4-SUPPL	16	p0520	N77-29597	#
FEA/B-76/403	14	p0208	N77-16455	#	FES-76/77-6	15	p0362	N77-24579	#
FEA/B-76/463	14	p0235	N77-21257	#					
FEA/B-76/492	16	p0539	N77-31661	#	FWA-NHI-76-N001	13	p0100	N77-11562	#
FEA/B-76/702	13	p0107	N77-12527	#					
FEA/B-77/106	16	p0513	N77-28573	#	FJSRL-TR-76-0008	14	p0226	N77-19659	#
FEA/B-77/135	16	p0558	N77-33664	#					
FEA/B-77/142	16	p0512	N77-28569	#	FRA/ORD-76-297	15	p0366	N77-24629	#
FEA/B-77/159	16	p0517	N77-28619	#					
FEA/B-77/166	16	p0559	N77-33675	#	FSEC-NSG-217-75/60	13	p0094	N77-11108	#
FEA/D-CP-48	13	p0091	N77-10690	#					
FEA/D-76/026	13	p0091	N77-10690	#	FTR-7	13	p0090	N77-10681	#
FEA/D-76/224	15	p0359	N77-24019	#					
FEA/D-76/229	16	p0524	N77-29636	#	G-7702-F4	13	p0128	N77-15491*	#
FEA/D-76/230	16	p0524	N77-29637	#	G-7703-X10	16	p0543	N77-32229*	#
FEA/D-76/289	15	p0367	N77-24631	#					
FEA/D-76/320	13	p0115	N77-13542	#	GA-A-13661	13	p0093	N77-10891	#
FEA/D-76/321	13	p0115	N77-13543	#	GA-A-14074	15	p0351	N77-22968	#
FEA/D-76/338	13	p0110	N77-12587	#	GA-A-14097	15	p0393	N77-27539	#
FEA/D-76/340	13	p0108	N77-12545	#					
FEA/D-76/363	13	p0116	N77-13555	#	GA/EE/76-1	15	p0353	N77-23143	#
FEA/D-76/392	15	p0361	N77-24514	#					
FEA/D-76/459	15	p0395	N77-27562	#	GAI-1915	13	p0115	N77-13553	#
FEA/D-77/023	15	p0370	N77-25014	#					
FEA/D-77/025	15	p0374	N77-25665	#	GEP/PH/76-11	15	p0361	N77-24483	#
FEA/D-77/027	16	p0517	N77-28616	#					
FEA/D-77/032	15	p0366	N77-24622	#	GE76TMP-27	15	p0367	N77-24634	#
FEA/D-77/039	16	p0519	N77-29026	#					
FEA/D-77/045	15	p0365	N77-24616	#	GPO-57-010	14	p0209	N77-17032	#
FEA/E-76/302	13	p0091	N77-10688	#	GPO-64-734	13	p0121	N77-14579	#
FEA/EI-1664	13	p0099	N77-11557	#	GPO-64-734-VOL-1	13	p0113	N77-13525	#
FEA/EI-1664-A	13	p0099	N77-11558	#	GPO-64-734-VOL-2	13	p0113	N77-13526	#
FEA/EI-1664-B	13	p0100	N77-11559	#	GPO-64-734-VOL-3	13	p0113	N77-13527	#
FEA/F-77/089	15	p0395	N77-27559	#	GPO-64-734-VOL-4	13	p0113	N77-13528	#
FEA/G-75/375	14	p0212	N77-17593	#	GPO-72-530	15	p0391	N77-27499	#
FEA/G-75/710	13	p0132	N77-15523	#	GPO-73-830	15	p0352	N77-23008	#
FEA/G-76/154	15	p0348	N77-22673	#	GPO-76-187	16	p0520	N77-29605	#
FEA/G-76/193	13	p0109	N77-12549	#	GPO-76-492	15	p0376	N77-26107	#
FEA/G-76/323	15	p0389	N77-27316	#	GPO-78-544	13	p0127	N77-15212	#
FEA/G-76/328	14	p0212	N77-17598	#	GPO-80-323	16	p0534	N77-31608	#
FEA/G-76/331	13	p0098	N77-11546	#	GPO-80-324	16	p0534	N77-31609	#
FEA/G-76/350	13	p0107	N77-12530	#	GPO-80-748	16	p0534	N77-31606	#
FEA/G-76/358	13	p0107	N77-12531	#	GPO-83-695	15	p0391	N77-27500	#
FEA/G-76/359	13	p0107	N77-12532	#	GPO-85-329	16	p0534	N77-31603	#
FEA/G-76/367	13	p0121	N77-14573	#	GPO-88-556	16	p0552	N77-33599	#
FEA/G-76/369	13	p0115	N77-13553	#	GPO-92-082	16	p0542	N77-32031	#
FEA/G-76/394	13	p0132	N77-15527	#	GPO-92-294	16	p0542	N77-32032	#
FEA/G-76/428	15	p0374	N77-25667	#	GPO-93-689	16	p0534	N77-31607	#
FEA/G-76/460	14	p0227	N77-19956	#					
FEA/G-76/496	15	p0349	N77-22677	#	GSA/FPA/MCL-TR-102	13	p0125	N77-14950	#
FEA/G-77/011	16	p0517	N77-28615	#					
FEA/G-77/044	15	p0356	N77-23618	#	HDL-TR-1780	15	p0357	N77-23635	#
FEA/G-77/046	15	p0375	N77-25670	#					
FEA/G-77/061	15	p0393	N77-27542	#	HEDL-SA-989	13	p0131	N77-15509	#
FEA/G-77/100	15	p0373	N77-25655	#					
FEA/H-76/220	13	p0096	N77-11509	#	HGP-TR-4	15	p0356	N77-23622	#
FEA/H-76/430	14	p0217	N77-18584	#	HGP-TR-13	15	p0342	N77-22587	#
FEA/H-77/030	15	p0368	N77-24667	#	HGP-TR-16	15	p0342	N77-22432	#
FEA/H-77/176	16	p0530	N77-30636	#	HGP-TR-17	14	p0252	N77-21726	#
FEA/N-76/411-VOL-1	15	p0374	N77-25661	#	HGP-TR-18	15	p0349	N77-22683	#
FEA/N-76/412-VOL-2	16	p0519	N77-29327	#	HGP-TR-20	15	p0349	N77-22684	#
FEA/N-76/416-VOL-6	16	p0516	N77-28606	#					
FEA/N-76/417-VOL-7	16	p0516	N77-28607	#	HI-2210/3-RR	13	p0126	N77-14981*	#
FEA/N-76/418	16	p0523	N77-29630	#					
FEA/N-76/419-VOL-9	16	p0519	N77-29325	#	HIG-CONTRIB-673	15	p0350	N77-22685	#
FEA/N-76/423-VOL-13	16	p0519	N77-29326	#					
FEA/N-77/116	16	p0523	N77-29629	#	HUD-CPD-140	13	p0132	N77-15527	#
FEA/S-76/310	13	p0105	N77-12500	#					
FEA/S-76/330	13	p0124	N77-14610	#	IABA-CN-36/175	16	p0560	N77-33681	#
FEA/S-76/368	13	p0113	N77-13516	#	IABA-CN-36/396	16	p0560	N77-33677	#
FEA/S-76/458	15	p0342	N77-22591	#	IABA-CN-36/397	16	p0548	N77-32619	#
FEA/S-76/487-VOL-1	15	p0349	N77-22675	#	IABA-CN-36/398	16	p0560	N77-33678	#
FEA/S-76/488-VOL-2	15	p0349	N77-22676	#	IABA-CN-36/428	16	p0549	N77-32895	#
FEA/S-76/490	15	p0362	N77-24573	#	IABA-CN-36/507	16	p0555	N77-33630	#
FEA/S-76/501	15	p0341	N77-22294	#	IABA-CN-36/538	16	p0560	N77-33679	#
FEA/S-76/502	15	p0362	N77-24579	#	IABA-CN-36/583	16	p0560	N77-33680	#
FEA/S-76/503	15	p0362	N77-24580	#					
FEA/S-77/114-SUPPL	16	p0520	N77-29597	#	IAP PAPER A-77-01	16	p0507	A77-51508	
FEA/S-77/123	16	p0520	N77-29598	#	IAP PAPER A-77-48	16	p0507	A77-51524	
FEA/T-76/514	15	p0348	N77-22674	#	IAP PAPER A-77-65	16	p0507	A77-51532	
FEA/T-77/018	15	p0347	N77-22649	#	IAP PAPER A-77-66	16	p0507	A77-51533	

# REPORT/ACCESSION NUMBER INDEX

IAF PAPER ISL-76-29 ..... 13 p0004 A77-10968 #  
 IAF PAPER ISL-76-59 ..... 13 p0004 A77-10970 #  
 IAF PAPER SL-77-52 ..... 16 p0508 A77-51561  
 IAF PAPER SL-77-62 ..... 16 p0508 A77-51565  
 IAF PAPER 76-111 ..... 13 p0003 A77-10911 #  
 IAF PAPER 76-117 ..... 13 p0003 A77-10913\*#  
 IAF PAPER 76-118 ..... 13 p0003 A77-10914 #  
 IAF PAPER 76-166 ..... 13 p0003 A77-10931 #  
 IAF PAPER 76-210 ..... 13 p0003 A77-10942 #  
 IAF PAPER 76-255 ..... 13 p0003 A77-10952 #  
 IAF PAPER 76-256 ..... 13 p0004 A77-10953 #  
 IAF PAPER 77-ST-11 ..... 16 p0508 A77-51575  
 IAF PAPER 77-22 ..... 16 p0506 A77-51390  
 IAF PAPER 77-54 ..... 16 p0506 A77-51411  
 IAF PAPER 77-60 ..... 16 p0506 A77-51415\*  
 IAF PAPER 77-65 ..... 16 p0507 A77-51416  
 IAF PAPER 77-104 ..... 16 p0507 A77-51431  
 IAF PAPER 77-141 ..... 16 p0507 A77-51444  
 IAF PAPER 77-142 ..... 16 p0507 A77-51445  
  
 ICAS PAPER 76-01 ..... 13 p0081 A77-19247 #  
 IDA-P-1252 ..... 16 p0512 N77-28569 #  
 IDA/HQ-77-19019 ..... 16 p0512 N77-28569 #  
  
 IEA-75-1 ..... 13 p0122 N77-14594 #  
 IEA-75-3 ..... 13 p0107 N77-12527 #  
  
 IGPP-UCR-75-10 ..... 15 p0355 N77-23593 #  
 IGPP-UCR-76-1 ..... 13 p0132 N77-15520 #  
 IGPP-UCR-76-6 ..... 15 p0343 N77-22602 #  
 IGPP-UCR-76-12 ..... 14 p0215 N77-18541 #  
  
 IIEQ-75-22 ..... 13 p0101 N77-11588 #  
 ILLDOE-76/01 ..... 15 p0350 N77-22686 #  
  
 INMR12-PD10-76 ..... 14 p0233 N77-20613 #  
 INMR15-PD11-76 ..... 13 p0133 N77-15539 #  
 INMR27-PD16-77 ..... 16 p0543 N77-32295 #  
  
 INIS-WF-1867 ..... 13 p0100 N77-11565 #  
 INIS-WF-1965 ..... 13 p0084 N77-10228 #  
  
 IPR-1 ..... 13 p0107 N77-12529 #  
 IPR-3 ..... 16 p0529 N77-30626 #  
  
 IPS-M-119-PT-1 ..... 15 p0368 N77-24709 #  
  
 IR-1 ..... 16 p0558 N77-33650 #  
 IR-2 ..... 13 p0129 N77-15496\*#  
 IR-2 ..... 14 p0212 N77-17599 #  
 IR-3 ..... 15 p0380 N77-26640 #  
  
 IS-3852 ..... 14 p0211 N77-17567 #  
  
 ISBN-0-309-02477-3 ..... 13 p0096 N77-11475 #  
 ISBN-0-309-02484-6 ..... 13 p0093 N77-10970 #  
 ISBN-0-309-02568-C ..... 15 p0370 N77-25018 #  
 ISBN-82-595-0654-8 ..... 16 p0551 N77-33464 #  
 ISBN-90-6144-C661 ..... 15 p0377 N77-26439 #  
 ISBN-92-63-10448-4 ..... 15 p0387 N77-27038 #  
  
 ISS-L-75/14 ..... 13 p0109 N77-12560 #  
  
 ISSN-0077-555X ..... 13 p0124 N77-14609 #  
 ISSN-0077-555X ..... 13 p0127 N77-15210 #  
  
 ITC-260675 ..... 14 p0226 N77-19662 #  
 ITC-260675-APP-A ..... 14 p0226 N77-19663 #  
 ITC-260675-APP-B ..... 14 p0226 N77-19663 #  
 ITC-260675-APP-C ..... 14 p0226 N77-19663 #  
  
 ITR-3 ..... 14 p0213 N77-17603 #  
 ITR-4 ..... 15 p0380 N77-26641 #  
  
 JPL-DOC-900-780 ..... 15 p0343 N77-22612\*#  
 JPL-DOC-5040-32-VOL-1 ..... 15 N77-22741\*#  
 JPL-DOC-5040-32-VOL-2 ..... 15 p0351 N77-22742\*#  
 JPL-DOC-5040-42 ..... 15 p0343 N77-22613\*#  
  
 JPL-PUB-77-27-BEV-1 ..... 16 p0553 N77-33604\*#  
 JPL-PUB-77-40 ..... 16 p0552 N77-33519\*#  
  
 JPL-PUBL-77-3 ..... 15 p0343 N77-22611\*#  
 JPL-PUBL-77-5 ..... 15 p0357 N77-23894\*#  
 JPL-PUBL-77-19 ..... 16 p0512 N77-28558\*#  
 JPL-PUBL-77-29 ..... 16 p0546 N77-32593\*#

JPL-PUBL-77-33 ..... 16 p0513 N77-28582\*#  
 JPL-PUBL-77-44 ..... 16 p0546 N77-32594\*#  
  
 JPL-SP-43-38-VOL-1 ..... 13 p0118 N77-14193\*#  
 JPL-SP-43-38-VOL-2 ..... 13 p0118 N77-14194\*#  
  
 JPL-TM-33-790 ..... 13 p0094 N77-11198\*#  
 JPL-TM-33-802 ..... 13 p0105 N77-12509\*#  
  
 JPL-77-34 ..... 16 p0518 N77-29003\*#  
 JPL-1200-237 ..... 15 p0340 N77-22290\*#  
 JPL-5040-6-VOL-1 ..... 15 p0371 N77-25612\*#  
 JPL-5040-6-VOL-2 ..... 15 p0371 N77-25613\*#  
 JPL-5040-6-VOL-3 ..... 15 p0371 N77-25614\*#  
 JPL-5040-43 ..... 13 p0122 N77-14586\*#  
 JPL-5040-44 ..... 13 p0129 N77-15497\*#  
 JPL-5101-7 ..... 13 p0086 N77-10637\*#  
  
 JSC-10747 ..... 14 p0253 N77-22005\*#  
 JSC-10873 ..... 15 p0362 N77-24585\*#  
 JSC-11404 ..... 13 p0126 N77-14955\*#  
 JSC-11568-VOL-1 ..... 14 p0207 N77-16442\*#  
 JSC-11568-VOL-2 ..... 14 p0207 N77-16443\*#  
 JSC-11625 ..... 16 p0561 N77-34050\*#  
 JSC-12973-VOL-2 ..... 16 p0552 N77-33600\*#  
  
 KVB-5802-432 ..... 15 p0348 N77-22668 #  
  
 L-11421 ..... 15 p0370 N77-25086\*#  
  
 LA-UR-76-369 ..... 13 p0087 N77-10650 #  
 LA-UR-76-418 ..... 13 p0123 N77-14601 #  
 LA-UR-76-848 ..... 14 p0221 N77-19598 #  
 LA-UR-76-1459 ..... 14 p0227 N77-19872 #  
 LA-UR-76-1672 ..... 14 p0221 N77-19597 #  
 LA-UR-76-1809 ..... 14 p0235 N77-21325 #  
 LA-UR-76-1998 ..... 15 p0398 N77-27996 #  
 LA-UR-76-2047 ..... 15 p0397 N77-27933 #  
 LA-UR-76-2060 ..... 15 p0351 N77-22975 #  
 LA-UR-76-2294 ..... 15 p0381 N77-26649 #  
 LA-UR-76-2473 ..... 15 p0397 N77-27932 #  
 LA-UR-77-99 ..... 15 p0389 N77-27311 #  
  
 LA-6174 ..... 14 p0214 N77-17892 #  
 LA-6424-MS ..... 15 p0369 N77-25010 #  
 LA-6448-PR ..... 15 p0344 N77-22623 #  
 LA-6514-MS ..... 15 p0361 N77-24431 #  
 LA-6525-PR ..... 15 p0372 N77-25639 #  
 LA-6539-PR ..... 15 p0385 N77-26703 #  
 LA-6569-MS ..... 16 p0557 N77-33646 #  
 LA-6646-MS ..... 16 p0520 N77-29455 #  
 LA-6720-PR ..... 16 p0533 N77-31428 #  
  
 LAS-PRC-76-01 ..... 15 p0373 N77-25653 #  
  
 LBL-4451 ..... 14 p0221 N77-19589 #  
 LBL-4458 ..... 13 p0122 N77-14592 #  
 LBL-4474 ..... 13 p0125 N77-14948 #  
 LBL-4495 ..... 14 p0236 N77-21532 #  
 LBL-4844 ..... 14 p0248 N77-21671 #  
 LBL-5273 ..... 16 p0532 N77-31269 #  
 LBL-5292 ..... 15 p0382 N77-26657 #  
 LBL-5329 ..... 15 p0352 N77-22998 #  
 LBL-5473 ..... 15 p0341 N77-22393 #  
 LBL-5927 ..... 16 p0558 N77-33655 #  
 LBL-5928 ..... 16 p0557 N77-33640 #  
  
 LC-76-26695 ..... 13 p0132 N77-15524 #  
 LC-76-608281 ..... 15 p0356 N77-23616 #  
 LC-77-608043 ..... 15 p0395 N77-27563 #  
  
 LEA-75-2 ..... 13 p0094 N77-11200 #  
  
 LEC-9764-VOL-1 ..... 15 p0372 N77-25631\*#  
  
 LHC-760504-A ..... 14 p0251 N77-21711 #  
 LHC-760504-A-APP ..... 15 p0347 N77-22652 #  
  
 LHSC-D462879 ..... 15 p0372 N77-25640 #  
  
 LHSC-HREC-PR-D496880 ..... 16 p0524 N77-29638 #  
  
 LR-27153 ..... 14 p0236 N77-21467\*#  
 LR-27230 ..... 14 p0236 N77-21468\*#  
 LR-27581 ..... 13 p0083 N77-10032\*#  
 LR-27769-1 ..... 13 p0126 N77-15008\*#  
 LR-27769-2 ..... 13 p0126 N77-15007\*#  
  
 LSU-T-76-006 ..... 16 p0516 N77-28610 #

## REPORT/ACCESSION NUMBER INDEX

M-199 .....	14	p0210	N77-17198**	NASA-CASE-MFS-23267-1 .....	14	p0228	N77-20401*
M-218 .....	14	p0229	N77-20567**	NASA-CASE-MFS-23349-1 .....	16	p0529	N77-30613**
M-224 .....	16	p0529	N77-30617**	NASA-CASE-MFS-23518-1 .....	16	p0535	N77-31610**
M-228 .....	16	p0521	N77-29606**	NASA-CASE-MFS-23518-2 .....	16	p0535	N77-31611**
M-229 .....	16	p0524	N77-29946**				
MA-RD-940-T76C65 .....	13	p0109	N77-12552 *	NASA-CASE-NPO-11609-2 .....	16	p0532	N77-31308*
MA-RD-940-T76074 .....	13	p0116	N77-13554 *	NASA-CASE-NPO-13510-1 .....	16	p0545	N77-32581*
				NASA-CASE-NPO-13560-1 .....	13	p0086	N77-10636*
MAT-75-20 .....	15	p0354	N77-23277 *	NASA-CASE-NPO-13561-1 .....	13	p0086	N77-10636*
				NASA-CASE-NPO-13579-2 .....	14	p0229	N77-20565**
MBB-URV-91-76-VOL-1 .....	15	p0354	N77-23175 *	NASA-CASE-NPO-13579-3 .....	14	p0229	N77-20566**
				NASA-CASE-NPO-13581-2 .....	16	p0513	N77-28584**
MCR-76-121 .....	14	p0216	N77-18570 *	NASA-CASE-NPO-13641-1 .....	15	p0360	N77-24340**
MCR-76-131 .....	15	p0394	N77-27550 *	NASA-CASE-NPO-13675-1 .....	16	p0544	N77-32580*
MCR-76-296 .....	15	p0394	N77-27551 *	NASA-CASE-NPO-13707-1 .....	16	p0518	N77-28933*
MCR-76-394 .....	13	p0113	N77-13533**	NASA-CASE-NPO-13736-1 .....	16	p0545	N77-32583*
MCR-77-234 .....	15	p0388	N77-27157**	NASA-CASE-NPO-13810-1 .....	16	p0545	N77-32582*
				NASA-CASE-NPO-13813-1 .....	14	p0220	N77-19579**
MDC-G6382 .....	14	p0231	N77-20591 *	NASA-CASE-NPO-13817-1 .....	16	p0513	N77-28583**
MDC-G6508-PT-1-VOL-1 .....	13	p0094	N77-11084**	NASA-CASE-NPO-13914-1 .....	14	p0220	N77-19579**
MDC-G6508-PT-1-VOL-2 .....	13	p0094	N77-11085**	NASA-CASE-NPO-13921-1 .....	15	p0363	N77-24590**
MDC-G6922-PT-3-VOL-1 .....	16	p0525	N77-30151**				
				NASA-CP-2001-VOL-3 .....	13	p0084	N77-10305**
MDC-J7340-VOL-1 .....	15	p0353	N77-23072**	NASA-CP-2010 .....	15	p0378	N77-26623**
MDC-J7340-VOL-2 .....	15	p0353	N77-23073**	NASA-CP-2010 .....	15	p0379	N77-26624**
				NASA-CP-2019 .....	16	p0525	N77-30273**
ME-RT-75009 .....	14	p0218	N77-18601 *				
				NASA-CR-2699 .....	13	p0083	N77-10033**
MERC/CR-77/4-VOL-1 .....	16	p0558	N77-33660 *	NASA-CR-2700 .....	13	p0083	N77-10032**
				NASA-CR-2771 .....	13	p0121	N77-14584**
MIT-EL-75-021 .....	13	p0086	N77-10626 *	NASA-CR-2800 .....	14	p0229	N77-20564**
MIT-EL-76-011WP-PT-2 .....	16	p0539	N77-31660 *	NASA-CR-2813 .....	14	p0228	N77-20559**
MIT-EL-76-013 .....	15	p0356	N77-23619 *	NASA-CR-2867 .....	16	p0550	N77-33255**
MIT-EL-76-014 .....	15	p0354	N77-23518 *	NASA-CR-2889 .....	16	p0521	N77-29606**
MIT-EL-76-015WP .....	16	p0518	N77-29001 *	NASA-CR-2890 .....	16	p0524	N77-29946**
				NASA-CR-134942-VOL-1 .....	15	p0379	N77-26628**
MML-TR-76-16C .....	15	p0350	N77-22688 *	NASA-CR-134942-VOL-2 .....	15	p0379	N77-26629**
MML-TR-77-27C .....	16	p0554	N77-33619 *	NASA-CR-134942-VOL-3 .....	15	p0379	N77-26630**
				NASA-CR-134949-VOL-1 .....	15	p0379	N77-26631**
MP-71 .....	13	p0127	N77-15210 *	NASA-CR-134949-VOL-2-PT-1 .....	15	p0379	N77-26632**
				NASA-CR-134949-VOL-2-PT-2 .....	15	p0379	N77-26633**
MRC-DA-452 .....	16	p0518	N77-28645 *	NASA-CR-134949-VOL-2-PT-3 .....	15	p0379	N77-26634**
MRC-DA-577 .....	15	p0367	N77-24665 *	NASA-CR-134949-VOL-2-PT-4 .....	15	p0380	N77-26635**
				NASA-CR-134949-VOL-3 .....	15	p0380	N77-26636**
MRC-TSR-1636 .....	14	p0228	N77-20191 *	NASA-CR-134955 .....	15	p0380	N77-26637**
				NASA-CR-134956 .....	14	p0236	N77-21467**
MRL-TN-388 .....	15	p0376	N77-26247	NASA-CR-134957 .....	14	p0236	N77-21468**
				NASA-CR-135035 .....	15	p0360	N77-24332**
MR175-FR-1382 .....	13	p0092	N77-10720 *	NASA-CR-135039 .....	13	p0113	N77-13532**
				NASA-CR-135056 .....	13	p0113	N77-13533**
MSNW/AC-76-2C74 .....	15	p0385	N77-26693 *	NASA-CR-135069 .....	13	p0103	N77-12182**
MSNW/HRPI-76-274 .....	15	p0383	N77-26677 *	NASA-CR-135095 .....	13	p0129	N77-15492**
				NASA-CR-135112 .....	13	p0103	N77-12230**
MTR-7137 .....	14	p0249	N77-21683 *	NASA-CR-135119 .....	15	p0376	N77-26134**
MTR-7241 .....	14	p0222	N77-19610 *	NASA-CR-135132 .....	16	p0520	N77-29519**
MTR-7367 .....	16	p0559	N77-33674 *	NASA-CR-135136 .....	13	p0127	N77-15043**
MTR-7455 .....	16	p0524	N77-29640 *	NASA-CR-135147 .....	15	p0390	N77-27496**
				NASA-CR-135152 .....	14	p0228	N77-20558**
M1.76-1 .....	13	p0103	N77-12230**	NASA-CR-135178 .....	14	p0234	N77-20886**
M74-61-VOL-1 .....	13	p0112	N77-13232 *	NASA-CR-135200 .....	16	p0529	N77-30610**
M74-61-VOL-2 .....	13	p0112	N77-13233 *	NASA-CR-135202 .....	16	p0546	N77-32590**
M77-19 .....	16	p0558	N77-33662 *	NASA-CR-135206-VOL-1 .....	16	p0553	N77-33608**
				NASA-CR-135206-VOL-2 .....	16	p0553	N77-33609**
NADC-76226-30 .....	15	p0340	N77-22270 *	NASA-CR-135230 .....	16	p0542	N77-32033**
				NASA-CR-135233 .....	16	p0520	N77-29604**
NAPTC-PT-82 .....	13	p0112	N77-13231 *	NASA-CR-135263 .....	16	p0546	N77-32592**
				NASA-CR-137912 .....	13	p0095	N77-11340**
NARADCOM-TR-76-61-AMBL .....	15	p0388	N77-27152 *	NASA-CR-137923 .....	15	p0353	N77-23072**
				NASA-CR-137924 .....	15	p0353	N77-23073**
NAS/ACT/P-755 .....	13	p0084	N77-10222 *	NASA-CR-137926 .....	13	p0126	N77-15007**
				NASA-CR-137927 .....	13	p0126	N77-15008**
NASA-CASE-BQN-10888-1 .....	15	p0342	N77-22484**	NASA-CR-137937 .....	13	p0118	N77-14029**
				NASA-CR-137938 .....	13	p0118	N77-14030**
NASA-CASE-LAR-11626-1 .....	13	p0103	N77-12332**	NASA-CR-137944 .....	13	p0093	N77-11054**
				NASA-CR-137953 .....	13	p0118	N77-14374**
NASA-CASE-LEW-12217-1 .....	14	p0214	N77-18429**	NASA-CR-137954 .....	13	p0118	N77-14375**
NASA-CASE-LEW-12220-1 .....	13	p0121	N77-14581*	NASA-CR-144838 .....	13	p0126	N77-14981**
NASA-CASE-LEW-12236-1 .....	14	p0211	N77-17565**	NASA-CR-144953A .....	15	p0388	N77-27104**
NASA-CASE-LEW-12508-2 .....	16	p0543	N77-32435**	NASA-CR-145161 .....	15	p0355	N77-23603**
NASA-CASE-LEW-12541-1 .....	15	p0344	N77-22615**	NASA-CR-148978 .....	13	p0085	N77-10590**
NASA-CASE-LEW-12552-1 .....	14	p0211	N77-17564**	NASA-CR-149091 .....	13	p0086	N77-10637**
NASA-CASE-LEW-12587-1 .....	16	p0534	N77-31601*	NASA-CR-149095 .....	13	p0085	N77-10665**
NASA-CASE-LEW-12785-1 .....	13	p0113	N77-13426**	NASA-CR-149131 .....	13	p0096	N77-11491**
NASA-CASE-LEW-12819-1 .....	15	p0363	N77-24593**	NASA-CR-149146 .....	13	p0094	N77-11198**
NASA-CASE-LEW-12830-1 .....	15	p0353	N77-23106*	NASA-CR-149181 .....	13	p0104	N77-12475**
				NASA-CR-149208 .....	13	p0104	N77-12486**
NASA-CASE-MFS-23062-1 .....	13	p0104	N77-12402*	NASA-CR-149228 .....	13	p0104	N77-12476**
				NASA-CR-149235 .....	13	p0105	N77-12509**
				NASA-CR-149242 .....	13	p0105	N77-12513**

# REPORT/ACCESSION NUMBER INDEX

NASA-CR-149284	14	p0215	N77-18525**	NASA-TM-X-73415	13	p0114	N77-13536**
NASA-CR-149342	13	p0122	N77-14586**	NASA-TM-X-73487	13	p0083	N77-10116**
NASA-CR-149364	13	p0118	N77-14193**	NASA-TM-X-73489	13	p0105	N77-12517**
NASA-CR-149365	13	p0118	N77-14194**	NASA-TM-X-73491	13	p0086	N77-10642**
NASA-CR-149373	13	p0129	N77-15497**	NASA-TM-X-73496	13	p0105	N77-12518**
NASA-CR-149451	13	p0106	N77-12524**	NASA-TM-X-73498	13	p0097	N77-11529**
NASA-CR-149573	14	p0214	N77-18511**	NASA-TM-X-73501	13	p0043	N77-10189**
NASA-CR-149669	14	p0215	N77-18557**	NASA-TM-X-73520	13	p0097	N77-11530**
NASA-CR-149812	14	p0220	N77-19575**	NASA-TM-X-73531	13	p0106	N77-12519**
NASA-CR-149814	14	p0227	N77-19899**	NASA-TM-X-73543	13	p0104	N77-12406**
NASA-CR-149815	14	p0227	N77-19898**	NASA-TM-X-73546	13	p0128	N77-15487**
NASA-CR-149858	14	p0219	N77-19573**	NASA-TM-X-73547	13	p0106	N77-12520**
NASA-CR-145863	14	p0220	N77-19578**	NASA-TM-X-73548	13	p0114	N77-13534**
NASA-CR-149864	14	p0220	N77-19577**	NASA-TM-X-73549	13	p0106	N77-12521**
NASA-CR-149886	14	p0227	N77-20116**	NASA-TM-X-73553	13	p0114	N77-13535**
NASA-CR-149887	14	p0229	N77-20561**	NASA-TM-X-73557	13	p0111	N77-13064**
NASA-CR-149888	14	p0228	N77-20560**	NASA-TM-X-73562	13	p0106	N77-12522**
NASA-CR-150024	13	p0085	N77-10610**	NASA-TM-X-73563	13	p0106	N77-12523**
NASA-CR-150032	13	p0086	N77-10638**	NASA-TM-X-73564	15	p0353	N77-23109**
NASA-CR-150045	16	p0551	N77-33479**	NASA-TM-X-73567	13	p0114	N77-13537**
NASA-CR-150146	13	p0129	N77-15494**	NASA-TM-X-73581	13	p0126	N77-15037**
NASA-CR-150147	13	p0129	N77-15495**	NASA-TM-X-73594	14	p0229	N77-20563**
NASA-CR-150148	13	p0129	N77-15496**	NASA-TM-X-73609	14	p0214	N77-17947**
NASA-CR-150152	13	p0127	N77-15347**	NASA-TM-X-73613	14	p0220	N77-19580**
NASA-CR-150171	14	p0207	N77-16447**	NASA-TM-X-73621	15	p0357	N77-23936**
NASA-CR-150176	14	p0210	N77-17560**	NASA-TM-X-73632	15	p0354	N77-23487**
NASA-CR-150300	15	p0378	N77-26610**	NASA-TM-X-73638	14	p0236	N77-21549**
NASA-CR-150305	15	p0378	N77-26611**	NASA-TM-X-73640	15	p0343	N77-22608**
NASA-CR-150957	13	p0097	N77-11532**	NASA-TM-X-73641	15	p0343	N77-22609**
NASA-CR-151102	13	p0094	N77-11084**	NASA-TM-X-73643	15	p0376	N77-26222**
NASA-CR-151103	13	p0094	N77-11085**	NASA-TM-X-73644	16	p0535	N77-31612**
NASA-CR-151422	15	p0372	N77-25631**	NASA-TM-X-73651	15	p0354	N77-23490**
NASA-CR-151460	15	p0388	N77-27157**	NASA-TM-X-73670	15	p0378	N77-26613**
NASA-CR-151503	16	p0525	N77-30151**	NASA-TM-X-73677	15	p0378	N77-26617**
NASA-CR-151506	16	p0553	N77-33605**	NASA-TM-X-73684	16	p0526	N77-30414**
NASA-CR-151507	16	p0553	N77-33606**	NASA-TM-X-73964	13	p0117	N77-13913**
NASA-CR-151977	15	p0342	N77-22422**	NASA-TM-X-74030	16	p0511	N77-28322**
NASA-CR-152015	16	p0527	N77-30415**	NASA-TM-X-74031	15	p0353	N77-23089**
NASA-CR-152027	16	p0520	N77-29451**	NASA-TM-X-74295	13	p0093	N77-11055**
NASA-CR-152542	15	p0390	N77-27493**	NASA-TM-X-74309	14	p0207	N77-16442**
NASA-CR-152613	16	p0552	N77-33603**	NASA-TM-X-74310	14	p0207	N77-16443**
NASA-CR-152676	15	p0343	N77-22611**	NASA-TM-X-74680	14	p0235	N77-21136**
NASA-CR-152683	15	p0352	N77-23007**	NASA-TM-X-74686	15	p0358	N77-24011**
NASA-CR-152685	15	p0352	N77-23010**	NASA-TM-X-74694	15	p0362	N77-24585**
NASA-CR-152686	15	p0343	N77-22613**				
NASA-CR-152688	15	p0343	N77-22612**	NASA-TM-58196	15	p0388	N77-27161**
NASA-CR-152689	15	p0357	N77-23894**	NASA-TM-73515	16	p0527	N77-30598**
NASA-CR-152693	15	p0351	N77-22742**	NASA-TM-73703	15	p0390	N77-27497**
NASA-CR-152694	15		N77-22741**	NASA-TM-73711	16	p0528	N77-30599**
NASA-CR-152696	15	p0344	N77-22614**	NASA-TM-73718	16	p0529	N77-30611**
NASA-CR-152814	15	p0340	N77-22290**	NASA-TM-73745	16	p0535	N77-31614**
NASA-CR-153009	15	p0361	N77-24561**	NASA-TM-74764	16	p0513	N77-28578**
NASA-CR-153060	15	p0362	N77-24581**	NASA-TM-74765	16	p0513	N77-28577**
NASA-CR-153221	15	p0371	N77-25612**	NASA-TM-74908	16	p0561	N77-34049**
NASA-CR-153222	15	p0371	N77-25613**	NASA-TM-74942	16	p0552	N77-33600**
NASA-CR-153223	15	p0371	N77-25614**	NASA-TM-75024	15	p0390	N77-27474**
NASA-CR-153401	16	p0528	N77-30608**	NASA-TM-75131	15	p0388	N77-27243**
NASA-CR-153409	16	p0528	N77-30604**	NASA-TM-75134	16	p0531	N77-30680**
NASA-CR-153415	16	p0528	N77-30606**	NASA-TM-75151	15	p0390	N77-27498**
NASA-CR-153905	15	p0391	N77-27502**	NASA-TM-78428	16	p0534	N77-31605**
NASA-CR-153909	15	p0391	N77-27505**				
NASA-CR-153977	16	p0528	N77-30605**	NASA-TM-D-8341	13	p0094	N77-11175**
NASA-CR-154103	16	p0513	N77-28582**	NASA-TM-D-8374	14	p0213	N77-17852**
NASA-CR-154119	16	p0512	N77-28558**	NASA-TM-D-8393	13	p0128	N77-15491**
NASA-CR-154251	16	p0518	N77-29003**	NASA-TM-D-8396	14	p0207	N77-16445**
NASA-CR-154618	15	p0387	N77-27020**	NASA-TM-D-8409	14	p0210	N77-17198**
NASA-CR-154846	16	p0531	N77-31040**	NASA-TM-D-8476	15	p0370	N77-25086**
NASA-CR-155042	16	p0546	N77-32594**	NASA-TM-D-8485	15	p0363	N77-24592**
NASA-CR-155045	16	p0546	N77-32593**	NASA-TM-D-8487	15	p0353	N77-23114**
NASA-CR-155155	16	p0552	N77-33601**				
NASA-CR-155158	16	p0550	N77-33347**	NASA-TP-1005	16	p0529	N77-30617**
NASA-CR-155166	16	p0553	N77-33604**	NASA-TP-1023	16	p0543	N77-32229**
NASA-CR-155180	16	p0552	N77-33519**				
NASA-TM-X-3455	13	p0095	N77-11268**	NASA-TT-F-16938	13	p0117	N77-13590**
NASA-TM-X-3465	13	p0121	N77-14585**	NASA-TT-F-17111	13	p0095	N77-11399**
NASA-TM-X-3505	15	p0363	N77-24587**	NASA-TT-F-17139	13	p0097	N77-11528**
NASA-TM-X-3509	14	p0229	N77-20567**	NASA-TT-F-17300	15	p0388	N77-27242**
NASA-TM-X-3531	16	p0521	N77-29607**	NASA-TT-F-17367	14	p0207	N77-16444**
NASA-TM-X-3551	15	p0370	N77-25345**	NASA-TT-F-17379	14	p0210	N77-17562**
NASA-TM-X-58188	13	p0126	N77-14955**	NASA-TT-F-17412	14	p0220	N77-19574**
NASA-TM-X-58189	14	p0253	N77-22005**				
NASA-TM-X-58193	16	p0561	N77-34050**	NBS-BSS-90	13	p0132	N77-15524 #
NASA-TM-X-71601	13	p0086	N77-10640**	NBS-BSS-104	16	p0559	N77-33669 #
NASA-TM-X-72753	14	p0207	N77-16446**				
NASA-TM-X-73344	13	p0128	N77-15486**	NBS-DIM-61-3	16	p0531	N77-31019 #
NASA-TM-X-73355	13	p0128	N77-15489**				
NASA-TM-X-73372	14	p0236	N77-21547**	NBS-HB-120	15	p0356	N77-23616 #
NASA-TM-X-73408	13	p0127	N77-15208**	NBS-SP-468	15	p0395	N77-27563 #

## REPORT/ACCESSION NUMBER INDEX

NBS-TN-937	16	p0550	N77-33370	NSF/RA-760223	15	p0357	N77-24624
NBS/DIM-61/5	16	p0542	N77-32027	NSF/RA-760224	14	p0233	N77-20617
NBSIR-75-1049	13	p0103	N77-12166	NSF/RA-760230	14	p0252	N77-21728
NBSIR-76-1056	13	p0091	N77-10687	NSF/RA-760235	14	p0215	N77-18541
NBSIR-76-1059	13	p0132	N77-15525	NSF/RA-760237	14	p0212	N77-17599
NBSIR-76-1082	14	p0213	N77-17600	NSF/RA-760246	15	p0349	N77-22678
NBSIR-76-1137	14	p0208	N77-16452	NSF/RA-760309	15	p0348	N77-22672
NBSIR-76-1177	16	p0539	N77-31665	NSF/RA-760313	15	p0350	N77-22688
NBSIR-76-1187	15	p0348	N77-22669	NSF/RA-760317	15	p0347	N77-22653
NBSIR-77-853	15	p0390	N77-27326	NSF/RA-760333	15	p0348	N77-22670
NBSIR-77-1204	16	p0554	N77-33614	NSF/RA-760342	14	p0252	N77-21732
NBSIR-77-1237	16	p0554	N77-33616	NSF/RA-760351	15	p0374	N77-25662
NBSIR-77-1238	16	p0546	N77-32596	NSF/RA-760354	15	p0366	N77-24628
NBSIR-77-1259	16	p0559	N77-33673	NSF/RA-760355	15	p0374	N77-25663
NEPP-III-B	16	p0548	N77-32617	NSF/RA-760364	15	p0347	N77-22654
NWAB-329	16	p0533	N77-31595	NSF/RA-760369	15	p0371	N77-25624
NOAA-TN-ERL-WFL-18	16	p0518	N77-28689	NSF/RA-760370-VOL-3	15	p0378	N77-26606
NOAA-76052603	13	p0108	N77-12547	NSF/RA-760372	15	p0342	N77-22587
NOAA-76071410	14	p0215	N77-18547	NSF/RA-760375	15	p0342	N77-22432
NOAA-77021602	16	p0516	N77-28610	NSF/RA-760376	14	p0252	N77-21726
NOAA-77021609	15	p0376	N77-26004	NSF/RA-760377	15	p0349	N77-22683
NOAA-77031804	16	p0518	N77-28689	NSF/RA-760378	15	p0349	N77-22684
NP-21307	15	p0364	N77-24603	NSF/RA-760379	14	p0251	N77-21711
NP-21308	15	p0365	N77-24611	NSF/RA-760380	15	p0347	N77-22652
NPS-69KK76091	15	p0348	N77-22666	NSF/RA-760395	16	p0516	N77-28609
NRC-76-7	15	p0397	N77-27951	NSF/RA-760397	15	p0357	N77-23626
NRC-15233	13	p0124	N77-14609	NSF/RA-760400	15	p0343	N77-22596
NRC-15638	13	p0127	N77-15210	NSF/RA-760401	15	p0355	N77-23594
NRL-GFD/OTEC-11-75	16	p0555	N77-33624	NSF/RA-760404	15	p0362	N77-24577
NRL-MR-3294	13	p0103	N77-12232	NSF/RA-760413	15	p0370	N77-25027
NRL-MR-3363	14	p0218	N77-18590	NSF/RA-760414-VOL-1	15	p0369	N77-24714
NRL-8013	13	p0127	N77-15121	NSF/RA-760415-VOL-2	15	p0369	N77-24715
NSF/AER-73-03357/A01/FR/76/1	14	p0233	N77-20618	NSF/RA-760416-VOL-3	15	p0369	N77-24716
NSF/DF-76-001A	13	p0098	N77-11544	NSF/RA-760422	15	p0366	N77-24620
NSF/ERG-75-48	15	p0375	N77-25673	NSF/RA-760426	15	p0343	N77-22602
NSF/ERG-76-4	13	p0098	N77-11543	NSF/RA-760444	15	p0387	N77-26987
NSF/ERSS-76-6	13	p0099	N77-11556	NSF/RA-760445	15	p0385	N77-26697
NSF/IDOE-76-05	14	p0253	N77-22016	NSF/RA-760448	15	p0395	N77-27561
NSF/PRA-7421320-1-6	15	p0354	N77-23518	NSF/RA-760474-PT-2	16	p0539	N77-31660
NSF/PRA-7501069-4-7	15	p0385	N77-26698	NSF/RA-760476	16	p0518	N77-29001
NSF/PRA-7501111/1/5	16	p0547	N77-32607	NSF/RA-760491	16	p0512	N77-28329
NSF/PRA-7505072	15	p0359	N77-24318	NSF/RA-760569	16	p0559	N77-33667
NSF/PRA-7516162	15	p0361	N77-24504	NSF/RA-760577	16	p0554	N77-33620
NSF/PRA-7521960/3/7	16	p0559	N77-33674	NSF/RA-760578	16	p0539	N77-31663
NSF/PRA-7615037-1-77	15	p0358	N77-24018	NSF/RA-760578	16	p0554	N77-33618
NSF/PRA-751616162-1-6	15	p0361	N77-24505	NSF/RA-760752	16	p0544	N77-32574
NSF/RA-76021	14	p0234	N77-20622	NSF/RA-760753-VOL-6	16	p0544	N77-32578
NSF/RA-7606188	15	p0382	N77-26663	NSF/RA-770017	16	p0517	N77-28620
NSF/RA-760008	13	p0121	N77-14495	NSF/RA-770030	16	p0518	N77-29007
NSF/RA-760026	13	p0093	N77-10964	NSF/RA-770056	16	p0523	N77-29634
NSF/RA-760059	13	p0089	N77-10672	NSF/RA-770063	16	p0554	N77-33619
NSF/RA-760090	14	p0218	N77-18597	NSF/RA-770068	16	p0548	N77-32614
NSF/RA-760100	13	p0091	N77-10689	NSF/RA-770094	16	p0544	N77-32577
NSF/RA-760101	13	p0090	N77-10678	NSF/RA-770098	16	p0547	N77-32604
NSF/RA-760102	13	p0098	N77-11547	NSF/RA-770099	16	p0547	N77-32603
NSF/RA-760120-VOL-1	13	p0089	N77-10665	NSF/RA/E-75-057	16	p0530	N77-30637
NSF/RA-760121-VOL-2	13	p0089	N77-10666	NSF/RA/N-73-271	16	p0511	N77-28327
NSF/RA-760129	13	p0109	N77-12553	NSF/RA/N-74-318	15	p0343	N77-22603
NSF/RA-760130	13	p0098	N77-11545	NSF/RA/N-74-326	15	p0356	N77-23622
NSF/RA-760156	13	p0096	N77-11511	NSF/RA/N-74-373	15	p0357	N77-23625
NSF/RA-760158	15	p0367	N77-24635	NSF/RA/N-75-049	13	p0123	N77-14603
NSF/RA-760160	13	p0115	N77-13552	NSF/RA/N-75-051	16	p0529	N77-30620
NSF/RA-760162	13	p0105	N77-12502	NSF/RA/N-75-093-VOL-2	15	p0346	N77-22642
NSF/RA-760163	13	p0090	N77-10685	NSF/RA/N-75-093A-VOL-1	15	p0346	N77-22640
NSF/RA-760172	14	p0251	N77-21709	NSF/RA/N-75-093B-VOL-1-APP-A	15	p0346	N77-22641
NSF/RA-760181	13	p0116	N77-13556	NSF/RA/N-75-093B-VOL-1-APP-B	15	p0346	N77-22641
NSF/RA-760184	14	p0226	N77-19667	NSF/RA/N-75-093C-VOL-3	15	p0346	N77-22643
NSF/RA-760185	13	p0098	N77-11544	NSF/RA/N-75-109	16	p0548	N77-32612
NSF/RA-760192	16	p0530	N77-30632	NSF/RA/N-75-224	13	p0090	N77-10676
NSF/RA-760195	14	p0235	N77-20972	NSF/RA/N-75-225	13	p0085	N77-10625
NSF/RA-760196	14	p0226	N77-19708	NSF/RA/N-75-231	13	p0090	N77-10675
NSF/RA-760197	14	p0234	N77-20676	NSF/RA/N-75-233	13	p0089	N77-10674
NSF/RA-760200	14	p0233	N77-20618	NSF/RA/N-75-283	13	p0101	N77-11577
NSF/RA-760202	14	p0233	N77-20616	NSF/RA/N-75-285	13	p0099	N77-11548
NSF/RA-760209	14	p0251	N77-21702	NSF/RA/N-75-294	16	p0530	N77-30645
				NSF/RA/N-75-301	13	p0090	N77-10680
				NSF/RA/N-75-309	13	p0108	N77-12548
				NSF/RA/N-75-310	13	p0099	N77-11551
				NSF/RA/N-75-336	15	p0351	N77-22750
				NSF/RA/N-75-338A-VOL-1	15	p0371	N77-25612
				NSF/RA/N-75-338B-VOL-2	15	p0371	N77-25613
				NSF/RA/N-75-338C-VOL-3-APP	15	p0371	N77-25614
				NSF/RA/N-75-348	15	p0350	N77-22685
				NSF/RA/N-75-352	15	p0395	N77-27564
				NSF/RA/N-75-353	14	p0252	N77-21731
				NSF/RA/N-75-361	15	p0355	N77-23593
				NSF/RA/S-75-101	15	p0370	N77-25021
				NSF/RA/N-760200	13	p0089	N77-10674
				NSF/RA/N-760202	13	p0089	N77-10672

# REPORT/ACCESSION NUMBER INDEX

NSP/RANN/AER75-20501/PR-76-1 ... 14 p0217 N77-18582 #  
 NSP/RANN/AER75-20501/PR-76-2 ... 14 p0217 N77-18583 #  
 NSP/RANN/GI-41891/PR/75/4 ... 16 p0558 N77-33652 #  
 NSP/RANN/SE/AER72-03579/A05 ... 13 p0090 N77-10685 #  
 NSP/RANN/SE/AER72-03579/A05-76 ... 15 p0366 N77-24628 #  
 NSP/RANN/SE/AER73-03197/PR-76 ... 15 p0357 N77-23624 #  
 NSP/RANN/SE/AER73-03197/PR-77 ... 16 p0547 N77-32604 #  
 NSP/RANN/SE/AER73-07957/PR-76 ... 13 p0090 N77-10678 #  
 NSP/RANN/SE/AER74-00239/PR-26 ... 15 p0382 N77-26664 #  
 NSP/RANN/SE/AER74-09186 ... 13 p0090 N77-10675 #  
 NSP/RANN/SE/AER74-14918-A01/PR ... 13 p0109 N77-12553 #  
 NSP/RANN/SE/AER74-15532/PR-76 ... 15 p0374 N77-25663 #  
 NSP/RANN/SE/AER74-17940-A01 ... 13 p0101 N77-11577 #  
 NSP/RANN/SE/AER75-1679/76 ... 14 p0251 N77-21702 #  
 NSP/RANN/SE/C-906/PR/76/1 ... 14 p0233 N77-20616 #  
 NSP/RANN/SE/ERT-74-19063/PR-75 ... 16 p0530 N77-30635 #  
 NSP/RANN/SE/GI-39117/PR-76/2 ... 14 p0250 N77-21690 #  
 NSP/RANN/SE/GI-43090/PR-75-2 ... 13 p0108 N77-12548 #  
 NSP/RANN/SE/GI-43895/PR-74-4 ... 13 p0099 N77-11551 #  
 NSP/RANN/SE/GI-143921/PR-76/1 ... 14 p0233 N77-20617 #  
 NUREG-0109 ... 13 p0125 N77-14740 #  
 NUREG-0116 ... 14 p0209 N77-16879 #  
 NUREG-0204 ... 16 p0547 N77-32606 #  
 NUREG-0252 ... 16 p0524 N77-29655 #  
 NUS-1725 ... 13 p0121 N77-14573 #  
 NYSEBDA-75/02 ... 13 p0101 N77-11575 #  
 NYSEBDA-75/16 ... 14 p0217 N77-18589 #  
 ONERA, TP NO. 1977-79 ... 15 p0321 A77-38533  
 ONRL-C-14-76 ... 13 p0131 N77-15511 #  
 ONRL-C-30-76 ... 15 p0347 N77-22656 #  
 ONRL-C-31-76 ... 15 p0366 N77-24627 #  
 ONRL-C-49-76 ... 15 p0385 N77-26696 #  
 ORAU-125 ... 13 p0122 N77-14594 #  
 ORAU-126 ... 13 p0094 N77-11200 #  
 ORNL-CON-4 ... 16 p0529 N77-30628 #  
 ORNL-CON-8 ... 16 p0557 N77-33644 #  
 ORNL-HUD-MIUS-6 ... 14 p0249 N77-21684 #  
 ORNL-MIT-28 ... 15 p0361 N77-24430 #  
 ORNL-TM-5069 ... 13 p0088 N77-10656 #  
 ORNL-TM-5428 ... 15 p0364 N77-24594 #  
 ORNL-TM-5470 ... 14 p0231 N77-20580 #  
 ORNL-TM-5498 ... 15 p0341 N77-22297 #  
 ORNL-TM-5525 ... 15 p0364 N77-24599 #  
 ORNL-TM-5529 ... 15 p0364 N77-24598 #  
 ORNL-TM-5592 ... 15 p0344 N77-22618 #  
 ORNL-TM-5608 ... 15 p0389 N77-27249 #  
 ORNL-TM-5649 ... 14 p0249 N77-21680 #  
 ORNL-TM-5682 ... 15 p0392 N77-27513 #  
 ORNL-TM-5688 ... 15 p0359 N77-24265 #  
 ORNL-TM-5700 ... 15 p0344 N77-22617 #  
 ORNL-TM-5703 ... 16 p0561 N77-33968 #  
 ORNL-TM-5787 ... 16 p0538 N77-31654 #  
 ORNL-TM-5795 ... 16 p0536 N77-31631 #  
 ORNL-TR-4231 ... 15 p0386 N77-26712 #  
 ORNL-5123-VOL-4 ... 14 p0216 N77-18566 #  
 ORNL-5159 ... 14 p0216 N77-18568 #  
 ORNL-5192 ... 15 p0392 N77-27520 #  
 ORNL-5198 ... 13 p0086 N77-10643 #  
 ORNL-5247-SUPPL-2 ... 16 p0542 N77-32036 #  
 ORO-4915-3 ... 14 p0248 N77-21669 #  
 ORO-4918-8 ... 14 p0217 N77-18578 #  
 ORO-4927-76-2 ... 15 p0391 N77-27506 #  
 ORO-4944-3 ... 13 p0123 N77-14600 #  
 ORO-5017-1 ... 15 p0386 N77-26787 #  
 ORSER-SSZL-TR-20-74 ... 14 p0215 N77-18525 #  
 OSURF-4122-1 ... 13 p0099 N77-11548 #  
 OTEL-1146/76 ... 13 p0094 N77-11158 #  
 OWRB-A-027-SC (2) ... 15 p0368 N77-24673 #  
 OWRB-A-028-AHIZ (4) ... 13 p0126 N77-14960 #  
 OWRB-A-037-TENN (1) ... 15 p0350 N77-22709 #  
 OWRB-A-080-WASH (1) ... 15 p0348 N77-22671 #  
 OWRB-A-197 (5254) (1) ... 15 p0354 N77-23592 #

OWRT-B-092-ILL (1) ... 15 p0352 N77-24022 #  
 OWRB-C-5205 (4210) (5) ... 15 p0367 N77-24634 #  
 OWRB-S-76-52 ... 14 p0234 N77-20656 #  
 P-1116-PT-2 ... 16 p0554 N77-33617 #  
 P-5547 ... 13 p0131 N77-15510 #  
 P-5577 ... 13 p0118 N77-14272 #  
 P-5578 ... 13 p0118 N77-14271 #  
 P-5616 ... 15 p0348 N77-22667 #  
 PAPER-10 ... 15 p0372 N77-25632 #  
 PAS-76-5 ... 13 p0131 N77-15514 #  
 PB-245422/1 ... 13 p0099 N77-11557 #  
 PB-245423/9 ... 13 p0099 N77-11558 #  
 PB-245424/7 ... 13 p0100 N77-11559 #  
 PB-249881/4 ... 13 p0101 N77-11575 #  
 PB-252409/8 ... 14 p0089 N77-10672 #  
 PB-252458/5 ... 13 p0093 N77-10964 #  
 PB-252462/7 ... 13 p0092 N77-10717 #  
 PB-252463/5 ... 13 p0098 N77-11543 #  
 PB-252473/4 ... 13 p0085 N77-10623 #  
 PB-252485/8 ... 13 p0088 N77-10662 #  
 PB-252486/6 ... 14 p0089 N77-10663 #  
 PB-252504/6 ... 13 p0085 N77-10625 #  
 PB-252539/2 ... 13 p0089 N77-10674 #  
 PB-252592/1 ... 13 p0090 N77-10675 #  
 PB-252608/5 ... 13 p0090 N77-10676 #  
 PB-252642/4 ... 13 p0086 N77-10626 #  
 PB-252837/0 ... 13 p0099 N77-11548 #  
 PB-252924/6 ... 14 p0101 N77-11577 #  
 PB-252994/9 ... 13 p0085 N77-10624 #  
 PB-253097/0 ... 13 p0099 N77-11556 #  
 PB-253099/6 ... 13 p0101 N77-11599 #  
 PB-253322/2 ... 13 p0089 N77-10670 #  
 PB-253361/0 ... 13 p0089 N77-10669 #  
 PB-253363/6 ... 13 p0084 N77-10221 #  
 PB-253375/0 ... 13 p0092 N77-10715 #  
 PB-253661/3 ... 13 p0092 N77-10707 #  
 PB-253713/2 ... 13 p0096 N77-11475 #  
 PB-253784/3 ... 13 p0089 N77-10673 #  
 PB-253908/8 ... 13 p0083 N77-10220 #  
 PB-253962/5 ... 13 p0099 N77-11553 #  
 PB-254059/9 ... 13 p0107 N77-12527 #  
 PB-254088/8 ... 13 p0084 N77-10222 #  
 PB-254163/9 ... 13 p0093 N77-10941 #  
 PB-254166/2 ... 13 p0101 N77-11581 #  
 PB-254167/0 ... 13 p0091 N77-10686 #  
 PB-254168/8 ... 13 p0092 N77-10722 #  
 PB-254179/5 ... 13 p0091 N77-10687 #  
 PB-254182/9 ... 13 p0092 N77-10719 #  
 PB-254222/3 ... 13 p0085 N77-10391 #  
 PB-254274/4 ... 13 p0093 N77-10731 #  
 PB-254314/8 ... 13 p0090 N77-10680 #  
 PB-254401/3 ... 13 p0109 N77-12568 #  
 PB-254413/8 ... 13 p0089 N77-10667 #  
 PB-254449/2 ... 13 p0092 N77-10720 #  
 PB-254466/6 ... 13 p0089 N77-10665 #  
 PB-254467/4 ... 13 p0089 N77-10666 #  
 PB-254637/2 ... 13 p0098 N77-11547 #  
 PB-254665/3 ... 13 p0091 N77-10689 #  
 PB-254730/5 ... 13 p0091 N77-10688 #  
 PB-254823/8 ... 13 p0095 N77-11380 #  
 PB-254878/2 ... 13 p0096 N77-11511 #  
 PB-254879/0 ... 13 p0090 N77-10678 #  
 PB-254925/1 ... 13 p0096 N77-11516 #  
 PB-254969/9 ... 13 p0084 N77-10224 #  
 PB-254988/9 ... 13 p0102 N77-11923 #  
 PB-254991/3 ... 13 p0086 N77-10633 #  
 PB-255117/4 ... 13 p0099 N77-11549 #  
 PB-255170/3 ... 13 p0107 N77-12526 #  
 PB-255171/1 ... 13 p0099 N77-11552 #  
 PB-255172/9 ... 13 p0125 N77-14939 #  
 PB-255176/0 ... 13 p0112 N77-13229 #  
 PB-255177/8 ... 13 p0112 N77-13230 #  
 PB-255302/2 ... 13 p0092 N77-10709 #  
 PB-255317/0 ... 13 p0110 N77-12597 #  
 PB-255319/6 ... 13 p0096 N77-11509 #  
 PB-255320/4 ... 13 p0096 N77-11515 #  
 PB-255349/3 ... 13 p0102 N77-11930 #  
 PB-255351/9 ... 13 p0091 N77-10690 #  
 PB-255401/2 ... 13 p0117 N77-13922 #  
 PB-255476/4 ... 13 p0098 N77-11546 #  
 PB-255488/9 ... 13 p0099 N77-11551 #  
 PB-255497/0 ... 13 p0096 N77-11518 #

REPORT/ACCESSION NUMBER INDEX

PB-255543/1	13	p0098	N77-11545	13	p0132	N77-15528
PB-255550/6	13	p0110	N77-12598	14	p0212	N77-17595
PB-255556/3	13	p0101	N77-11589	14	p0208	N77-16456
PB-255586/0	13	p0116	N77-13566	13	p0132	N77-15524
PB-255590/2	13	p0104	N77-12486	14	p0212	N77-17594
PB-255606/6	13	p0109	N77-12553	14	p0208	N77-16454
PB-255607/4	13	p0105	N77-12502	14	p0218	N77-18596
PB-255623/1	13	p0111	N77-12930	14	p0212	N77-17598
PB-255624/9	13	p0108	N77-12540	14	p0208	N77-16452
PB-255630/6	13	p0126	N77-14960	14	p0213	N77-17647
PB-255635/5	13	p0093	N77-10970	14	p0207	N77-16433
PB-255639/7	13	p0109	N77-12552	14	p0210	N77-17555
PB-255646/2	13	p0109	N77-12551	14	p0213	N77-17600
PB-255652/0	13	p0108	N77-12545	14	p0208	N77-16457
PB-255658/7	13	p0115	N77-13542	14	p0209	N77-16879
PB-255659/5	13	p0115	N77-13543	14	p0212	N77-17599
PB-255695/9	13	p0096	N77-11513	14	p0219	N77-19279
PB-255696/7	13	p0100	N77-11561	14	p0217	N77-18582
PB-255697/5	13	p0100	N77-11563	14	p0217	N77-18584
PB-255699/1	13	p0101	N77-11588	14	p0218	N77-18594
PB-255703/1	13	p0090	N77-10685	14	p0233	N77-20616
PB-255726/2	13	p0093	N77-10974	14	p0217	N77-18583
PB-255765/0	13	p0107	N77-12528	14	p0233	N77-20617
PB-255813/8	13	p0102	N77-11603	14	p0233	N77-20618
PB-255842/7	13	p0125	N77-14638	14	p0208	N77-16455
PB-255855/9	13	p0109	N77-12549	14	p0215	N77-18541
PB-255857/5	13	p0100	N77-11562	14	p0218	N77-18597
PB-255859/1	13	p0125	N77-14950	14	p0215	N77-18547
PB-255903/7	13	p0108	N77-12548	14	p0225	N77-19657
PB-255920/1	13	p0124	N77-14608	14	p0225	N77-19658
PB-255927/6	13	p0110	N77-12592	14	p0233	N77-20608
PB-255929/2	13	p0121	N77-14495	14	p0251	N77-21702
PB-255937/5	13	p0110	N77-12587	14	p0235	N77-20972
PB-255947/4	13	p0124	N77-14610	14	p0227	N77-19953
PB-255948/2	13	p0105	N77-12500	14	p0234	N77-20656
PB-255956/5	13	p0110	N77-12581	14	p0217	N77-18589
PB-255991/2	13	p0107	N77-12530	14	p0226	N77-19667
PB-255992/0	13	p0107	N77-12531	14	p0228	N77-20197
PB-255993/8	13	p0107	N77-12532	14	p0234	N77-20676
PB-255994/6	13	p0107	N77-12533	14	p0226	N77-19708
PB-255995/3	13	p0108	N77-12534	14	p0233	N77-20613
PB-256007/6	13	p0112	N77-13232	14	p0227	N77-19956
PB-256008/4	13	p0112	N77-13233	14	p0234	N77-20622
PB-256020/9	13	p0103	N77-12231	14	p0234	N77-20639
PB-256034/0	13	p0109	N77-12554	14	p0233	N77-20610
PB-256044/9	13	p0116	N77-13555	14	p0226	N77-19683
PB-256093/6	13	p0108	N77-12547	14	p0235	N77-21257
PB-256117/3	13	p0108	N77-12536	15	p0341	N77-22292
PB-256155/3	13	p0109	N77-12555	14	p0252	N77-21721
PB-256198/3	13	p0115	N77-13552	14	p0252	N77-21722
PB-256264/3	13	p0103	N77-12166	14	p0251	N77-21716
PB-256293/2	13	p0101	N77-11602	14	p0253	N77-22016
PB-256320/3	13	p0116	N77-13569	14	p0234	N77-20879
PB-256321/1	13	p0116	N77-13570	14	p0236	N77-21356
PB-256420/1	13	p0115	N77-13551	14	p0234	N77-20880
PB-256424/3	13	p0110	N77-12576	15	p0341	N77-22398
PB-256615/6	13	p0108	N77-12538	14	p0251	N77-21706
PB-256635/4	13	p0098	N77-11544	15	p0349	N77-22680
PB-256649/5	13	p0124	N77-14630	15	p0347	N77-22646
PB-256665/1	13	p0115	N77-13553	15	p0346	N77-22644
PB-256679/2	13	p0125	N77-14631	15	p0346	N77-22645
PB-256680/0	13	p0121	N77-14573	15	p0351	N77-22775
PB-256684/2	14	p0208	N77-16450	15	p0352	N77-23021
PB-256691/7	13	p0133	N77-15540	15	p0341	N77-22295
PB-256714/7	13	p0113	N77-13516	14	p0251	N77-21709
PB-256766/7	13	p0115	N77-13550	14	p0252	N77-21725
PB-256775/8	13	p0116	N77-13556	15	p0352	N77-23022
PB-256806/1	13	p0115	N77-13549	15	N77-22732	
PB-256845/9	14	p0208	N77-16453	14	p0230	N77-20577
PB-256846/7	13	p0111	N77-12946	15	p0351	N77-22750
PB-256898/8	13	p0133	N77-15923	15	p0350	N77-22709
PB-256966/3	13	p0132	N77-15523	15	p0349	N77-22678
PB-256997/8	13	p0103	N77-12203	15	p0342	N77-22587
PB-257036/4	13	p0133	N77-15539	15	p0342	N77-22432
PB-257054/7	13	p0125	N77-14740	14	p0252	N77-21726
PB-257086/9	13	p0132	N77-15525	15	p0349	N77-22683
PB-257105/7	13	p0133	N77-15919	15	p0349	N77-22684
PB-257134/7	14	p0209	N77-16470	15	p0346	N77-22640
PB-257136/2	13	p0133	N77-15550	15	p0346	N77-22641
PB-257137/0	13	p0133	N77-15541	15	p0346	N77-22642
PB-257146/1	13	p0125	N77-14643	15	p0346	N77-22643
PB-257177/6	13	p0133	N77-15930	15	p0349	N77-22677
PB-257182/6	13	p0125	N77-14645	15	p0347	N77-22653
PB-257225/3	13	p0132	N77-15520	15	p0350	N77-22685
PB-257374/9	13	p0132	N77-15527	15	p0348	N77-22670
PB-257441/6	14	p0212	N77-17593	15	p0350	N77-22687
PB-257444/0	13	p0116	N77-13554	15	p0348	N77-22674
PB-257544/7	14	p0208	N77-16449	15	p0342	N77-22591
PB-257546/2	14	p0208	N77-16459	14	p0251	N77-21711
PB-257553/8	13	p0132	N77-15528			
PB-257557/9	14	p0212	N77-17595			
PB-257570/2	14	p0208	N77-16456			
PB-257581/9	13	p0132	N77-15524			
PB-257615/5	14	p0212	N77-17594			
PB-257678/3	14	p0208	N77-16454			
PB-257697/3	14	p0218	N77-18596			
PB-257764/1	14	p0212	N77-17598			
PB-257770/8	14	p0208	N77-16452			
PB-257975/3	14	p0213	N77-17647			
PB-258067/8	14	p0207	N77-16433			
PB-258101/5	14	p0210	N77-17555			
PB-258235/1	14	p0213	N77-17600			
PB-258264/1	14	p0208	N77-16457			
PB-258316/9	14	p0209	N77-16879			
PB-258493/6	14	p0212	N77-17599			
PB-258499/3	14	p0219	N77-19279			
PB-258583/4	14	p0217	N77-18582			
PB-258624/6	14	p0217	N77-18584			
PB-258652/7	14	p0218	N77-18594			
PB-258738/4	14	p0233	N77-20616			
PB-258746/7	14	p0217	N77-18583			
PB-258845/7	14	p0233	N77-20617			
PB-258848/1	14	p0233	N77-20618			
PB-258865/5	14	p0208	N77-16455			
PB-258871/3	14	p0215	N77-18541			
PB-258948/9	14	p0218	N77-18597			
PB-259074/3	14	p0215	N77-18547			
PB-259158/4	14	p0225	N77-19657			
PB-259159/2	14	p0225	N77-19658			
PB-259177/4	14	p0233	N77-20608			
PB-259195/6	14	p0251	N77-21702			
PB-259206/1	14	p0235	N77-20972			
PB-259211/1	14	p0227	N77-19953			
PB-259272/3	14	p0234	N77-20656			
PB-259289/7	14	p0217	N77-18589			
PB-259318/4	14	p0226	N77-19667			
PB-259351/5	14	p0228	N77-20197			
PB-259378/8	14	p0234	N77-20676			
PB-259379/6	14	p0226	N77-19708			
PB-259388/7	14	p0233	N77-20613			
PB-259764/9	14	p0227	N77-19956			
PB-259898/5	14	p0234	N77-20622			
PB-259911/6	14	p0234	N77-20639			
PB-259956/1	14	p0233	N77-20610			
PB-259970/2	14	p0226	N77-19683			
PB-260535/0	14	p0235	N77-21257			
PB-260565/7	15	p0341	N77-22292			
PB-260594/7	14	p0252	N77-21721			
PB-260595/4	14	p0252	N77-21722			
PB-260606/9	14	p0251	N77-21716			
PB-260633/3	14	p0253	N77-22016			
PB-260653/1	14	p0234	N77-20879			
PB-260683/8	14	p0236	N77-21356			
PB-260691/1	14	p0234	N77-20880			
PB-260719/0	15	p0341	N77-22398			
PB-260835/4	14	p0251	N77-21706			
PB-260848/7	15	p0349	N77-22680			
PB-261064/0	15	p0347	N77-22646			
PB-261150/7	15	p0346	N77-22644			
PB-261153/1	15	p0346	N77-22645			
PB-261178/8	15	p0351	N77-22775			
PB-261259/6	15	p0352	N77-23021			
PB-261278/6	15	p0341	N77-22295			
PB-261319/8	14	p0251	N77-21709			
PB-261349/5	14	p0252	N77-21725			
PB-261364/4	15	p0352	N77-23022			
PB-261416/2	15	N77-22732				
PB-261469/1	14	p0230	N77-20577			
PB-261507/8	15	p0351	N77-22750			
PB-261512/8	15	p0350	N77-22709			
PB-261521/9	15	p0349	N77-22678			
PB-261558/1	15	p0342	N77-22587			
PB-261561/5	15	p0342	N77-22432			
PB-261562/3	14	p0252	N77-21726			
PB-261563/1	15	p0349	N77-22683			
PB-261564/9	15	p0349	N77-22684			
PB-261566/4	15	p0346	N77-22640			
PB-261567/2	15	p0346	N77-22641			
PB-261568/0	15	p0346	N77-22642			
PB-261569/8	15	p0346	N77-22643			
PB-261661/3	15	p0349	N77-22677			
PB-261687/8	15	p0347	N77-22653			
PB-261691/0	15	p0350	N77-22685			
PB-261715/7	15	p0348	N77-22670			
PB-261734/8	15	p0350	N77-22687			
PB-261736/3	15	p0348	N77-22674			
PB-261737/1	15	p0342	N77-22591			
PB-26174						



## REPORT/ACCESSION NUMBER INDEX

PB-261744/7	14	p0252	N77-21728	#	PB-263598/5	15	p0360	N77-24320	#
PB-261754/6	15	p0348	N77-22668	#	PB-263604/1	15	p0357	N77-23625	#
PB-261766/0	14	p0251	N77-21718	#	PB-263625/6	15	p0356	N77-23621	#
PB-261771/0	15		N77-22725	#	PB-263651/2	15	p0359	N77-24318	#
PB-261799/1	15	p0349	N77-22675	#	PB-263683/5	15	p0370	N77-25027	#
PB-261800/7	15	p0349	N77-22676	#	PB-263689/2	15	p0360	N77-24319	#
PB-261845/2	14	p0251	N77-21712	#	PB-263692/6	15	p0369	N77-24714	#
PB-261850/2	15	p0348	N77-22672	#	PB-263693/4	15	p0369	N77-24715	#
PB-261857/7	14	p0252	N77-21732	#	PB-263694/2	15	p0369	N77-24716	#
PB-261910/4	15	p0350	N77-22688	#	PB-263761/9	15	p0367	N77-24635	#
PB-261916/1	15	p0350	N77-22705	#	PB-263834/6	15	p0371	N77-25612*	#
PB-261917/9	15	p0350	N77-22700	#	PB-263834/4	15	p0371	N77-25613*	#
PB-261925/2	15	p0349	N77-22679	#	PB-263835/1	15	p0371	N77-25614*	#
PB-261984/9	15	p0341	N77-22294	#	PB-263873/2	15	p0387	N77-26987	#
PB-262003/7	15	p0358	N77-24002	#	PB-263992/0	15	p0368	N77-24671	#
PB-262015/1	15	p0354	N77-23507	#	PB-264048/0	15	p0375	N77-25674	#
PB-262016/9	14	p0252	N77-21727	#	PB-264052/2	15	p0375	N77-25673	#
PB-262030/0	15	p0347	N77-22652	#	PB-264057/1	15	p0368	N77-24672	#
PB-262114/2	15	p0348	N77-22659	#	PB-264068/8	15	p0359	N77-24316	#
PB-262125/8	15	p0347	N77-22657	#	PB-264069/6	16	p0516	N77-28606	#
PB-262134/0	15	p0348	N77-22673	#	PB-264082/9	15	p0376	N77-26028	#
PB-262159/7	15	p0347	N77-22659	#	PB-264111/6	15	p0372	N77-25625	#
PB-262181/1	15	p0347	N77-22649	#	PB-264221/3	15	p0385	N77-26697	#
PB-262182/9	15	p0347	N77-22650	#	PB-264268/4	15	p0383	N77-26619	#
PB-262331/2	16	p0539	N77-31661	#	PB-264269/2	15	p0384	N77-26680	#
PB-262361/9	15	p0374	N77-25669	#	PB-264270/0	15	p0384	N77-26681	#
PB-262362/7	15	p0367	N77-24636	#	PB-264271/8	15	p0384	N77-26682	#
PB-262372/6	15	p0347	N77-22654	#	PB-264272/6	15	p0384	N77-26683	#
PB-262382/5	15	p0348	N77-22671	#	PB-264273/4	15	p0384	N77-26684	#
PB-262390/8	15	p0362	N77-24572	#	PB-264274/2	15	p0384	N77-26685	#
PB-262391/6	14	p0252	N77-21731	#	PB-264275/9	15	p0384	N77-26686	#
PB-262396/5	15	p0374	N77-25663	#	PB-264276/7	15	p0384	N77-26687	#
PB-262450/0	15	p0366	N77-24628	#	PB-264277/5	15	p0384	N77-26688	#
PB-262451/8	15	p0362	N77-24573	#	PB-264278/3	15	p0385	N77-26689	#
PB-262470/8	15	p0366	N77-24629	#	PB-264279/1	15	p0385	N77-26690	#
PB-262476/5	15	p0368	N77-24711	#	PB-264280/9	15	p0385	N77-26691	#
PB-262483/1	15	p0374	N77-25667	#	PB-264281/7	15	p0385	N77-26692	#
PB-262491/4	15	p0373	N77-25654	#	PB-264415/1	15	p0378	N77-26606	#
PB-262508/5	15	p0362	N77-24580	#	PB-264449/0	15	p0395	N77-27562	#
PB-262512/7	15	p0361	N77-24504	#	PB-264451/6	15	p0373	N77-25655	#
PB-262513/5	15	p0361	N77-24505	#	PB-264458/1	15	p0385	N77-26698	#
PB-262532/5	15	p0370	N77-25021	#	PB-264483/9	15	p0375	N77-25684	#
PB-262533/3	15	p0343	N77-22604	#	PB-264495/3	15	p0376	N77-25685	#
PB-262536/6	15	p0374	N77-25662	#	PB-264589/3	15	p0389	N77-27316	#
PB-262562/2	15	p0350	N77-22686	#	PB-264649/5	16	p0516	N77-28607	#
PB-262575/4	15	p0343	N77-22603	#	PB-264702/2	15	p0389	N77-27247	#
PB-262576/2	15	p0374	N77-25665	#	PB-264705/5	15	p0383	N77-26677	#
PB-262643/0	15	p0343	N77-22602	#	PB-264706/3	15	p0385	N77-26693	#
PB-262646/3	15	p0374	N77-25666	#	PB-264740/2	15	p0395	N77-27559	#
PB-262704/0	15	p0356	N77-23622	#	PB-264760/0	15	p0395	N77-27560	#
PB-262726/3	15	p0360	N77-24321	#	PB-264811/1	15	p0376	N77-26004	#
PB-262750/3	15	p0368	N77-24709	#	PB-264822/8	16	p0517	N77-28628	#
PB-262789/1	15	p0371	N77-25551	#	PB-264891/3	15	p0396	N77-27625	#
PB-262828/7	15	p0355	N77-23593	#	PB-264897/0	15	p0371	N77-25623	#
PB-262839/4	15	p0362	N77-24579	#	PB-265003/4	15	p0395	N77-27561	#
PB-262841/0	15	p0366	N77-24622	#	PB-265015/8	16	p0518	N77-29001	#
PB-262843/6	15	p0367	N77-24631	#	PB-265076/0	15	p0390	N77-27326	#
PB-262844/4	15	p0374	N77-25668	#	PB-265086/9	16	p0523	N77-29630	#
PB-262846/9	15	p0368	N77-24667	#	PB-265100/8	16	p0518	N77-29007	#
PB-262850/1	15	p0367	N77-24665	#	PB-265104/0	15	p0395	N77-27564	#
PB-262858/4	15	p0360	N77-24371	#	PB-265116/4	16	p0516	N77-28609	#
PB-262878/2	15	p0370	N77-25018	#	PB-265195/8	16	p0523	N77-29629	#
PB-262884/0	15	p0362	N77-24577	#	PB-265236/0	15	p0398	N77-28046	#
PB-262890/7	15	p0357	N77-23626	#	PB-265267/5	16	p0516	N77-28610	#
PB-262910/3	15	p0343	N77-22596	#	PB-265488/7	16	p0520	N77-29598	#
PB-262980/6	15	p0356	N77-23619	#	PB-265490/3	16	p0517	N77-28616	#
PB-263012/7	15	p0358	N77-24018	#	PB-265552/0	15	p0395	N77-27563	#
PB-263020/0	15	p0374	N77-25661	#	PB-265554/6	16	p0516	N77-28613	#
PB-263022/6	15	p0361	N77-24514	#	PB-265633/8	16	p0516	N77-28614	#
PB-263048/1	15	p0370	N77-25014	#	PB-265706/2	16	p0517	N77-28615	#
PB-263087/9	15	p0359	N77-24019	#	PB-265762/5	16	p0511	N77-28327	#
PB-263091/1	15	p0354	N77-23592	#	PB-265772/4	16	p0519	N77-29325	#
PB-263120/8	15	p0355	N77-23594	#	PB-265796/3	16	p0520	N77-29597	#
PB-263121/6	15	p0356	N77-23616	#	PB-265804/5	16	p0519	N77-29026	#
PB-263172/9	15	p0357	N77-23624	#	PB-265815/1	15	p0393	N77-27542	#
PB-263192/7	16	p0530	N77-30632	#	PB-265822/7	16	p0519	N77-29327	#
PB-263338/6	15	p0356	N77-23620	#	PB-265824/3	16	p0519	N77-29326	#
PB-263369/1	15	p0356	N77-23618	#	PB-265838/3	16	p0512	N77-28569	#
PB-263371/7	15	p0375	N77-25670	#	PB-265848/2	16	p0513	N77-28573	#
PB-263418/6	15	p0365	N77-24616	#	PB-265877/1	16	p0519	N77-29323	#
PB-263434/3	15	p0355	N77-23597	#	PB-265878/9	16	p0519	N77-29324	#
PB-263453/3	15	p0368	N77-24674	#	PB-265983/7	16	p0523	N77-29635	#
PB-263480/6	15	p0367	N77-24634	#	PB-266010/8	16	p0518	N77-28689	#
PB-263488/9	15	p0368	N77-24673	#	PB-266039/7	16	p0517	N77-28619	#
PB-263505/0	15	p0356	N77-23617	#	PB-266042/1	16	p0523	N77-29626	#
PB-263515/9	15	p0370	N77-25280	#	PB-266043/9	16	p0523	N77-29627	#
PB-263523/3	15	p0354	N77-23518	#	PB-266044/7	16	p0523	N77-29628	#
PB-263576/1	15	p0366	N77-24620	#	PB-266055/3	16	p0517	N77-28620	#
PB-263595/1	15	p0367	N77-24633	#	PB-266057/9	16	p0517	N77-28618	#

# REPORT/ACCESSION NUMBER INDEX

PB-266064/5 ..... 16 p0523 N77-29634 #  
 PB-266092/6 ..... 16 p0517 N77-28642 #  
 PB-266111/4 ..... 16 p0512 N77-28328 #  
 PB-266211/2 ..... 16 p0524 N77-29636 #  
 PB-266212/0 ..... 16 p0524 N77-29637 #  
 PB-266217/9 ..... 16 p0518 N77-28645 #  
 PB-266218/7 ..... 16 p0524 N77-29638 #  
 PB-266231/0 ..... 16 p0517 N77-28644 #  
 PB-266240/1 ..... 16 p0523 N77-29633 #  
 PB-266256/7 ..... 16 p0523 N77-29632 #  
 PB-266266/6 ..... 16 p0513 N77-28575 #  
 PB-266419/1 ..... 16 p0524 N77-29640 #  
 PB-266607/1 ..... 16 p0512 N77-28329 #  
 PB-266724/4 ..... 16 p0530 N77-30657 #  
 PB-266762/4 ..... 16 p0533 N77-31589 #  
 PF-266765/7 ..... 16 p0541 N77-32009 #  
 PB-266769/9 ..... 16 p0527 N77-30589 #  
 PB-266830/9 ..... 16 p0539 N77-31660 #  
 PB-266836/6 ..... 16 p0530 N77-30633 #  
 PB-266841/6 ..... 16 p0530 N77-30636 #  
 PB-266854/9 ..... 16 p0525 N77-30255 #  
 PB-266961/2 ..... 16 p0531 N77-31040\*\*  
 PB-266985/1 ..... 16 p0558 N77-33664 #  
 PB-266997/6 ..... 16 p0531 N77-31019 #  
 PB-267096/6 ..... 16 p0549 N77-32638 #  
 PB-267134/5 ..... 16 p0530 N77-30637 #  
 PB-267210/3 ..... 16 p0530 N77-30635 #  
 PB-267214/5 ..... 16 p0533 N77-31595 #  
 PB-267237/6 ..... 16 p0524 N77-29655 #  
 PB-267280/6 ..... 16 p0540 N77-31725 #  
 PB-267281/4 ..... 16 p0554 N77-33616 #  
 PB-267321/8 ..... 16 p0542 N77-32027 #  
 PB-267368/9 ..... 16 p0543 N77-32335 #  
 PB-267443/0 ..... 16 p0558 N77-33662 #  
 PB-267447/1 ..... 16 p0548 N77-32612 #  
 PB-267537/9 ..... 16 p0544 N77-32508 #  
 PB-267575/9 ..... 16 p0541 N77-31823 #  
 PB-267613/8 ..... 16 p0560 N77-33700 #  
 PB-267629/4 ..... 16 p0531 N77-31046 #  
 PB-267722/7 ..... 16 p0539 N77-31664 #  
 PB-267800/1 ..... 16 p0555 N77-33621 #  
 PB-267829/0 ..... 16 p0539 N77-31665 #  
 PB-267832/4 ..... 16 p0539 N77-31663 #  
 PF-267832/4 ..... 16 p0554 N77-33618 #  
 PB-267865/4 ..... 16 p0540 N77-31685 #  
 PB-267901/7 ..... 16 p0539 N77-31666 #  
 PB-267923/1 ..... 16 p0541 N77-31824 #  
 PB-267937/1 ..... 16 p0554 N77-33619 #  
 PB-267986/8 ..... 16 p0554 N77-33620 #  
 PB-268067/7 ..... 16 p0540 N77-31667 #  
 PB-268106/2 ..... 16 p0543 N77-32295 #  
 PB-268149/2 ..... 16 p0547 N77-32601 #  
 PB-268232/6 ..... 16 p0542 N77-32051 #  
 PB-268240/9 ..... 16 p0543 N77-32277 #  
 PB-268289/6 ..... 16 p0544 N77-32579 #  
 PB-268301/9 ..... 16 p0548 N77-32617 #  
 PB-268323/3 ..... 16 p0548 N77-32618 #  
 PB-268409/0 ..... 16 p0548 N77-32616 #  
 PB-268411/6 ..... 16 p0547 N77-32607 #  
 PB-268421/5 ..... 16 p0544 N77-32574 #  
 PB-268422/3 ..... 16 p0544 N77-32577 #  
 PB-268423/1 ..... 16 p0544 N77-32578 #  
 PB-268457/9 ..... 16 p0547 N77-32604 #  
 PB-268479/2 ..... 16 p0559 N77-33668 #  
 PB-268481/9 ..... 16 p0547 N77-32605 #  
 PB-268492/6 ..... 16 p0548 N77-32615 #  
 PB-268514/7 ..... 16 p0547 N77-32603 #  
 PB-268524/6 ..... 16 p0548 N77-32614 #  
 PB-268576/6 ..... 16 p0548 N77-32613 #  
 PB-268718/4 ..... 16 p0559 N77-33667 #  
 PB-268781/2 ..... 16 p0559 N77-33674 #  
 PB-268873/7 ..... 16 p0559 N77-33673 #  
 PB-268989/1 ..... 16 p0559 N77-33670 #  
 PB-269034/5 ..... 16 p0559 N77-33675 #  
 PB-269244/0 ..... 16 p0549 N77-32681 #  
 PB-269270/5 ..... 16 p0561 N77-34058 #  
 PB-269297/8 ..... 16 p0559 N77-33669 #  
 PB-269299/4 ..... 16 p0559 N77-33671 #  
 PB-269301/8 ..... 16 p0559 N77-33672 #  
 PB-269390/1 ..... 16 p0547 N77-32606 #  
 PERC-0058-4 ..... 13 p0130 N77-15505 #  
 PERC/EI-77/5 ..... 16 p0540 N77-31671 #  
 PFTR-1030-76-8 ..... 13 p0085 N77-10610\*\*  
 POLY-EE/EP-76-022 ..... 16 p0533 N77-31495 #

PPI-1014-11 ..... 14 p0228 N77-20558\*\*  
 PPPL-1284 ..... 15 p0358 N77-23942 #  
 PPPL-1285 ..... 15 p0342 N77-22469 #  
 PPPL-1303 ..... 15 p0376 N77-25965 #  
 PR-1 ..... 14 p0250 N77-21689 #  
 PR-1 ..... 16 p0535 N77-31620 #  
 PR-3 ..... 15 p0350 N77-22688 #  
 PR-4 ..... 16 p0554 N77-33619 #  
 PR-7 ..... 15 p0340 N77-22263 #  
 PR-101-4 ..... 16 p0522 N77-29619 #  
 PRINT-95-2 ..... 16 p0534 N77-31608 #  
 PRINT-95-3 ..... 16 p0534 N77-31609 #  
 PRRL-76-CR-25 ..... 15 p0374 N77-25663 #  
 PRS-8 ..... 14 p0227 N77-19956 #  
 PSD-R-109 ..... 15 p0390 N77-27496\*\*  
 PT-67 ..... 16 p0514 N77-28596 #  
 PUBL-9516 ..... 16 p0552 N77-33599 #  
 QPR-1 ..... 13 p0086 N77-10637\*\*  
 QPR-1 ..... 13 p0090 N77-10678 #  
 QPR-2 ..... 15 p0348 N77-22670 #  
 QPR-3 ..... 13 p0109 N77-12553 #  
 QPR-3 ..... 14 p0215 N77-18561 #  
 QPR-3 ..... 14 p0227 N77-19898\*\*  
 QPR-4 ..... 13 p0096 N77-11511 #  
 QPR-5 ..... 13 p0104 N77-12475\*\*  
 QPR-15 ..... 15 p0390 N77-27410 #  
 QR-1 ..... 14 p0216 N77-18571 #  
 QR-1 ..... 15 p0362 N77-24541\*\*  
 QR-1 ..... 15 p0395 N77-27561 #  
 QR-2 ..... 16 p0528 N77-30604\*\*  
 QR-2 ..... 16 p0528 N77-30605\*\*  
 QR-3 ..... 14 p0211 N77-17570 #  
 QR-3 ..... 16 p0517 N77-28616 #  
 QR-4 ..... 15 p0377 N77-26324 #  
 QR-4 ..... 16 p0528 N77-30606\*\*  
 QR-7 ..... 15 p0391 N77-27502\*\*  
 QR-13 ..... 15 p0341 N77-22297 #  
 QR-14 ..... 15 p0389 N77-27249 #  
 QR-10045-2 ..... 15 p0348 N77-22670 #  
 QTPR-2 ..... 13 p0127 N77-15401 #  
 QTPR-2 ..... 14 p0225 N77-19649 #  
 QTPR-2 ..... 14 p0231 N77-20591 #  
 QTPR-4 ..... 14 p0227 N77-19899\*\*  
 R-1590-NSF ..... 13 p0085 N77-10625 #  
 R-1591-NSF/EPA ..... 13 p0090 N77-10680 #  
 R-1829-PR ..... 16 p0525 N77-30261 #  
 R-1889-AF ..... 16 p0532 N77-31334 #  
 R-1889/1-AF ..... 16 p0550 N77-33154 #  
 R-2086-ISA ..... 16 p0553 N77-33610 #  
 R-9967 ..... 15 p0396 N77-27923 #  
 RA-75-46C ..... 13 p0096 N77-11516 #  
 RAH-070-VOL-2 ..... 13 p0107 N77-12532 #  
 RAH-070A-VOL-1 ..... 13 p0107 N77-12531 #  
 RE-5429-97-76 ..... 13 p0115 N77-13543 #  
 REPT-1 ..... 15 p0371 N77-25447 #  
 REPT-2 ..... 15 p0391 N77-27506 #  
 REPT-5 ..... 15 p0361 N77-24504 #  
 REPT-76-9B9-ECAS-R2-VOL-1 ..... 15 p0379 N77-26628\*\*  
 REPT-76-9B9-ECAS-R2-VOL-2 ..... 15 p0379 N77-26629\*\*  
 REPT-76-9B9-ECAS-R2-VOL-3 ..... 15 p0379 N77-26630\*\*  
 REPT-76-9G9-TFSOL-R2 ..... 13 p0109 N77-12553 #  
 REPT-76-112-1 ..... 13 p0104 N77-12476\*\*  
 REPT-76-145-2-VOL-1 ..... 13 p0129 N77-15494\*\*  
 REPT-76-145-2-VOL-2 ..... 13 p0129 N77-15495\*\*  
 REPT-76-145-2-VOL-3 ..... 13 p0129 N77-15496\*\*  
 REPT-76-242-1 ..... 15 p0361 N77-24561\*\*  
 REPT-77-9F9-TFSOL-EI ..... 16 p0523 N77-29635 #  
 REPT-114 ..... 13 p0130 N77-15502 #  
 REPT-273-C ..... 13 p0110 N77-12572 #  
 REPT-380-4686F ..... 13 p0108 N77-12539 #  
 REPT-380-5313 ..... 16 p0546 N77-32590\*\*  
 REPT-380-6240 ..... 16 p0520 N77-29604\*\*

# REPORT/ACCESSION NUMBER INDEX

FEPT-2033-76 ..... 16 p0556 N77-33635 #  
 FEPT-2340-I-1 ..... 16 p0553 N77-33613 #  
 FEPT-3884-FR ..... 13 p0129 N77-15492\*\*  
 FEPT-6930 ..... 15 p0358 N77-24002 #  
 FEPT-8291-01 ..... 15 p0352 N77-23007\*\*  
 RFP-TRANS-204-FT-1 ..... 15 p0346 N77-22637 #  
 RM-629 ..... 16 p0534 N77-31604 #  
 RPI-TA-17 ..... 15 p0380 N77-26638 #  
 RR-2 ..... 13 p0118 N77-14374\*\*  
 RR-53 ..... 15 p0350 N77-22709 #  
 RTOP-777-30-01 ..... 13 p0122 N77-14586\*\*  
 RTOP-777-30-01 ..... 13 p0129 N77-15497\*\*  
 RUS-PATENT-CLASS-52-518 ..... 16 p0534 N77-31601\*  
 R76AEG597 ..... 13 p0127 N77-15043\*\*  
 S-REPT-94-633 ..... 14 p0209 N77-17032 #  
 SAE PAPER 760161 ..... 13 p0016 A77-12150  
 SAE PAPER 770047 ..... 16 p0424 A77-44557  
 SAE PAPER 770080 ..... 16 p0424 A77-44558  
 SAE PAPER 770081 ..... 16 p0424 A77-44559  
 SAE PAPER 770082 ..... 16 p0424 A77-44560  
 SAE PAPER 770280 ..... 16 p0424 A77-44563  
 SAE PAPER 770281 ..... 16 p0424 A77-44564  
 SAE PAPER 770466 ..... 15 p0310 A77-37084  
 SAE PAPER 770470 ..... 15 p0310 A77-37088\*  
 SAN/1038-76/1 ..... 15 p0365 N77-24606 #  
 SAN/1081-76/1 ..... 15 p0372 N77-25640 #  
 SAN/1083-76/1 ..... 15 p0394 N77-27549 #  
 SAN/1084-75/1 ..... 14 p0248 N77-21673 #  
 SAN/1108-76/2 ..... 14 p0231 N77-20591 #  
 SAN/1109-76/T1 ..... 14 p0216 N77-18571 #  
 SAN/1110-76/T1 ..... 14 p0216 N77-18570 #  
 SAN/1110-76/T2 ..... 14 p0248 N77-21668 #  
 SAN/1110-76/1 ..... 15 p0394 N77-27550 #  
 SAN/1110-76/2 ..... 15 p0394 N77-27551 #  
 SAN/1111-75/1 ..... 14 p0230 N77-20576 #  
 SAN/1111-76/2 ..... 14 p0225 N77-19649 #  
 SAN/1122-76/1 ..... 14 p0225 N77-19648 #  
 SAN/1140-1/2-VOL-2 ..... 16 p0558 N77-33657 #  
 SAND-75-0284 ..... 16 p0521 N77-29612 #  
 SAND-75-5910 ..... 13 p0130 N77-15504 #  
 SAND-75-8063 ..... 13 p0088 N77-10655 #  
 SAND-76-0009 ..... 13 p0097 N77-11537 #  
 SAND-76-0012 ..... 13 p0122 N77-14587 #  
 SAND-76-0130 ..... 14 p0214 N77-18057 #  
 SAND-76-0205 ..... 14 p0211 N77-17571 #  
 SAND-76-0264-VOL-2-NO-2 ..... 15 p0372 N77-25638 #  
 SAND-76-0338 ..... 14 p0250 N77-21686 #  
 SAND-76-0363 ..... 14 p0251 N77-21699 #  
 SAND-76-0425 ..... 16 p0535 N77-31619 #  
 SAND-76-0581 ..... 16 p0521 N77-29613 #  
 SAND-76-0611 ..... 15 p0389 N77-27312 #  
 SAND-76-0723 ..... 16 p0536 N77-31630 #  
 SAND-76-5061 ..... 15 p0345 N77-22635 #  
 SAND-76-5141 ..... 14 p0224 N77-19628 #  
 SAND-76-5291 ..... 14 p0216 N77-18574 #  
 SAND-76-5311 ..... 15 p0380 N77-26647 #  
 SAND-76-5542 ..... 14 p0219 N77-19425 #  
 SAND-76-5586 ..... 14 p0250 N77-21688 #  
 SAND-76-5683 ..... 14 p0217 N77-18576 #  
 SAND-76-5712 ..... 14 p0223 N77-19616 #  
 SAND-76-5758 ..... 16 p0514 N77-28591 #  
 SAND-76-5759 ..... 14 p0225 N77-19647 #  
 SAND-76-5763 ..... 15 p0393 N77-27541 #  
 SAND-76-8039 ..... 15 p0345 N77-22636 #  
 SAND-76-8229 ..... 14 p0224 N77-19638 #  
 SAND-76-8255 ..... 15 p0395 N77-27553 #  
 SAND-76-8511 ..... 15 p0377 N77-26253 #  
 SAND-76-8663 ..... 14 p0248 N77-21674 #  
 SAND-76-8677 ..... 15 p0344 N77-22624 #  
 SAND-76-9142 ..... 15 p0381 N77-26653 #  
 SAND-77-0004 ..... 16 p0558 N77-33654 #  
 SAND-77-0034 ..... 16 p0555 N77-33629 #  
 SATR-3 ..... 14 p0218 N77-18601 #  
 SAE PAPER 1101 ..... 13 p0016 A77-12181 #  
 SAE PAPER 1124 ..... 13 p0016 A77-12192\*\*  
 SAE PAPER 1126 ..... 13 p0016 A77-12194\*\*

SAWE PAPER 1127 ..... 13 p0016 A77-12195 #  
 SCRC-CR-76-46 ..... 14 p0252 N77-21732 #  
 SC5005.46FR ..... 15 p0355 N77-23603\*\*  
 SD-75-SA-0166 ..... 14 p0249 N77-21685 #  
 SD-76-SA-0230 ..... 13 p0127 N77-15347\*\*  
 SD-77-AP-0088 ..... 16 p0520 N77-29451\*\*  
 SE-4578-76/1 ..... 15 p0373 N77-25647 #  
 SER-7 ..... 15 p0387 N77-27038 #  
 SES-8 ..... 15 p0364 N77-24604 #  
 SGR-TR-12 ..... 14 p0251 N77-21709 #  
 SP-3 ..... 14 p0215 N77-18547 #  
 SPD-332-03 ..... 13 p0127 N77-15220 #  
 SPE-5351 ..... 15 p0395 N77-27564 #  
 SRD-76-064-1-VOL-1 ..... 15 p0379 N77-26631\*\*  
 SRD-76-064-2-VOL-2-PT-1 ..... 15 p0379 N77-26632\*\*  
 SRD-76-064-2-VOL-2-PT-2 ..... 15 p0379 N77-26633\*\*  
 SRD-76-064-2-VOL-2-PT-3 ..... 15 p0379 N77-26634\*\*  
 SRD-76-064-2-VOL-2-PT-4 ..... 15 p0380 N77-26635\*\*  
 SRD-76-064-3 ..... 15 p0380 N77-26636\*\*  
 SRD-77-063 ..... 16 p0548 N77-32618 #  
 SRI-EGU-3505-UR-1-VOL-1 ..... 13 p0107 N77-12533 #  
 SRI-EGU-3505-VOL-2 ..... 13 p0108 N77-12534 #  
 SRI-EGU-4064 ..... 15 p0361 N77-24504 #  
 SRI-EGU-4064-FR ..... 15 p0361 N77-24505 #  
 SRI/CRESS-17 ..... 16 p0518 N77-29007 #  
 SS-503 ..... 16 p0539 N77-31666 #  
 SSC-258 ..... 13 p0120 N77-14492 #  
 SSS-R-77-2998 ..... 15 p0347 N77-22653 #  
 STF71-A75036 ..... 16 p0551 N77-33464 #  
 SU-HTGL-104 ..... 13 p0111 N77-12879 #  
 SU-SOL-76-23 ..... 15 p0365 N77-24619 #  
 SU-SRI-3570-17 ..... 13 p0101 N77-11602 #  
 SX/105/7Q ..... 15 p0391 N77-27502\*\*  
 SX/111/1Q ..... 15 p0362 N77-24581\*\*  
 SX/111/2Q ..... 16 p0528 N77-30604\*\*  
 T-1701 ..... 15 p0343 N77-22603 #  
 TE-4233-152-77 ..... 16 p0546 N77-32592\*\*  
 TE-5429-97-76 ..... 13 p0115 N77-13542 #  
 TEC-75/007 ..... 15 p0340 N77-22290\*\*  
 TEC-77/001 ..... 16 p0514 N77-28596 #  
 TETRAT-A-412-75-011-APP-A ..... 13 p0099 N77-11558 #  
 TETRAT-A-412-75-011-APP-B ..... 13 p0100 N77-11559 #  
 TETRAT-A-412-75-011-F ..... 13 p0099 N77-11557 #  
 TETRAT-A-463-76-248 ..... 14 p0209 N77-16460 #  
 TETRAT-A-642-75-169-PT-1-5 ..... 13 p0089 N77-10664 #  
 TETRAT-A-642-76-254 ..... 14 p0218 N77-18592 #  
 TETRAT-A-642-77-306 ..... 16 p0522 N77-29624 #  
 TH-76-B-66 ..... 15 p0377 N77-26439 #  
 TI-03-77-17 ..... 15 p0391 N77-27505\*\*  
 TID-3354-R1 ..... 14 p0249 N77-21676 #  
 TID-4500 ..... 14 p0232 N77-20606 #  
 TID-4500 ..... 15 p0352 N77-23072 #  
 TID-4581-R3 ..... 13 p0102 N77-11695 #  
 TID-27003 ..... 13 p0100 N77-11573 #  
 TID-27032 ..... 14 p0211 N77-17570 #  
 TID-27035 ..... 14 p0211 N77-17580 #  
 TID-27129 ..... 14 p0250 N77-21689 #  
 TID-27143 ..... 15 p0377 N77-26393 #  
 TID-27144 ..... 15 p0396 N77-27923 #  
 TID-27145 ..... 15 p0396 N77-27922 #  
 TID-27156 ..... 15 p0345 N77-22630 #

# REPORT/ACCESSION NUMBER INDEX

TID-27164	15	p0383	N77-26675	#	UCRL-52041	14	p0219	N77-19469	#
TID-27192	15	p0364	N77-24600	#	UCRL-52043	14	p0221	N77-19586	#
TID-27252	15	p0380	N77-26644	#	UCRL-52110	15	p0394	N77-27548	#
TID-27301	15	p0392	N77-27526	#	UCRL-52137	15	p0355	N77-24610	#
TID-27336	15	p0377	N77-26324	#	UCRL-52169	16	p0522	N77-29616	#
TID-27348-VOL-2	16	p0537	N77-31639	#	UCRL-52177	16	p0511	N77-28323	#
TID-27348-VOL-3	16	p0537	N77-31638	#	UCRL-52180	16	p0536	N77-31628	#
TID-27424-VOL-1	16	p0541	N77-31945	#	UCRL-52208	16	p0514	N77-28593	#
TID-27427	16	p0538	N77-31646	#	UCRL-76203	15	p0381	N77-26652	#
TID-27428	16	p0538	N77-31645	#	UCRL-76844	13	p0087	N77-10652	#
TID-27429	16	p0538	N77-31648	#	UCRL-76980	14	p0216	N77-18575	#
TID-27430	16	p0537	N77-31644	#	UCRL-77722	13	p0091	N77-10697	#
TID-27431	16	p0537	N77-31642	#	UCRL-77801	13	p0124	N77-14611	#
TID-27432	16	p0538	N77-31647	#	UCRL-77829	13	p0123	N77-14596	#
TID-27433	16	p0537	N77-31643	#	UCRL-77831	13	p0129	N77-15499	#
TID-27435	16	p0538	N77-31655	#	UCRL-77875	14	p0232	N77-20598	#
TID-27444	16	p0556	N77-33632	#	UCRL-77895	14	p0231	N77-20592	#
TK-75-0016	13	p0110	N77-12587	#	UCRL-78066	14	p0219	N77-19275	#
TM-77-5	15	p0378	N77-26610*	#	UCRL-78082	15	p0351	N77-22967	#
TOP-2-2-701	15	p0359	N77-24314	#	UCRL-78085	14	p0225	N77-19645	#
TPR-015	16	p0553	N77-33605*	#	UCRL-78153	14	p0223	N77-19626	#
TPR-028-4	16	p0553	N77-33606*	#	UCRL-78288	14	p0232	N77-20601	#
TR-1	13	p0110	N77-12598	#	UCRL-78390	14	p0221	N77-19587	#
TR-2-7	15	p0378	N77-26623*	#	UCRL-78500	15	p0381	N77-26651	#
TR-2-8	15	p0379	N77-26624*	#	UCRL-78614	14	p0253	N77-21939	#
TR-6	16	p0535	N77-31615	#	UCRL-78682	15	p0397	N77-27926	#
TR-130	16	p0531	N77-31024	#	UE-308-FR	15	p0341	N77-22293	#
TRB/SR-166	13	p0096	N77-11475	#	UEC-LLL-760920	16	p0536	N77-31626	#
TRB/TRR-571	13	p0093	N77-10970	#	UHNE/SOL/11	14	p0233	N77-20618	#
TRB/TRR-599	15	p0370	N77-25018	#	UIIU-WRC-76-0116	15	p0352	N77-23022	#
TREE-1008	15	p0393	N77-27538	#	UIUC-CAC-DN-76-198	15	p0385	N77-26697	#
TREE-1036	16	p0511	N77-28324	#	UNC-SSL-1	15	p0373	N77-25654	#
TREE-1048	16	p0547	N77-32609	#	UMD-4908-5	13	p0088	N77-10657	#
TRITA-PFU-77-02	16	p0549	N77-32910	#	UMTA-CA-06-0071-76-1	13	p0111	N77-12946	#
TRW-24916-6041-RU-00	13	p0101	N77-11581	#	UMTA-IT-06-0104-77-2	15	p0376	N77-26028	#
TRW-26148-60C4-RU-00	13	p0103	N77-12182*	#	UMTA-RD-CA-06-0088-76-2	16	p0518	N77-29003*	#
TRW-26263-6026-RU-00	13	p0118	N77-14375*	#	UMTA-RDD-9-75-1	13	p0102	N77-11930	#
TRW-28455-6001-RU-00	14	p0220	N77-19575*	#	UMTA-URT-3-75-6	13	p0102	N77-11923	#
TT-A-872-77-316	16	p0529	N77-30623	#	UNC-SG-76-04	13	p0108	N77-12547	#
TT-7605	16	p0519	N77-29320	#	UNM-TR-ME-70 (76) NASA-365-1	13	p0095	N77-11340*	#
UCD-472-500	16	p0540	N77-31672	#	US-PATENT-APPL-SN-228229	16	p0532	N77-31308*	#
UCID-16630-3	13	p0123	N77-14604	#	US-PATENT-APPL-SN-487156	13	p0086	N77-10636	#
UCID-17011	13	p0100	N77-11572	#	US-PATENT-APPL-SN-536786	16	p0545	N77-32581*	#
UCID-17067	13	p0132	N77-15533	#	US-PATENT-APPL-SN-591569	13	p0104	N77-12402*	#
UCID-17068	14	p0212	N77-17581	#	US-PATENT-APPL-SN-596641	15	p0353	N77-23106*	#
UCID-17086	13	p0105	N77-12506	#	US-PATENT-APPL-SN-606891	13	p0121	N77-14581*	#
UCID-17098-VOL-2	14	p0228	N77-20443	#	US-PATENT-APPL-SN-617202	16	p0518	N77-28933*	#
UCID-17157-1	14	p0221	N77-19588	#	US-PATENT-APPL-SN-653422	14	p0228	N77-20401*	#
UCID-17163	14	p0215	N77-18562	#	US-PATENT-APPL-SN-655149	15	p0353	N77-23106*	#
UCID-17177	14	p0231	N77-20590	#	US-PATENT-APPL-SN-658132	16	p0544	N77-32580*	#
UCID-17316-PT-1	15	p0387	N77-27036	#	US-PATENT-APPL-SN-674700	16	p0532	N77-31308*	#
UCID-17316-PT-2	15	p0387	N77-27037	#	US-PATENT-APPL-SN-681017	16	p0545	N77-32583*	#
UCID-17343	15	p0398	N77-28038	#	US-PATENT-APPL-SN-681096	16	p0545	N77-32582*	#
UCID-17443	16	p0557	N77-33639	#	US-PATENT-APPL-SN-717319	16	p0534	N77-31601*	#
UCID-52000-76-2	13	p0131	N77-15508	#	US-PATENT-APPL-SN-739909	13	p0113	N77-13426*	#
UCLA-ENG-7625	14	p0248	N77-21673	#	US-PATENT-APPL-SN-744542	13	p0103	N77-12332*	#
UCLA-ENG-7719	16	p0523	N77-29634	#	US-PATENT-APPL-SN-760057	15	p0342	N77-22488*	#
UCRL-TRANS-10998	13	p0088	N77-10659	#	US-PATENT-APPL-SN-760771	14	p0211	N77-17565*	#
UCRL-TRANS-11018	13	p0120	N77-14486	#	US-PATENT-APPL-SN-762362	14	p0229	N77-20565*	#
UCRL-5196-REV-1	13	p0106	N77-12525	#	US-PATENT-APPL-SN-762363	14	p0229	N77-20566*	#
UCRL-13684	14	p0222	N77-19612	#	US-PATENT-APPL-SN-763753	14	p0214	N77-18429*	#
UCRL-13695	15	p0386	N77-26977	#	US-PATENT-APPL-SN-765139	14	p0220	N77-19579*	#
UCRL-13711	16	p0536	N77-31626	#	US-PATENT-APPL-SN-776869	14	p0211	N77-17564*	#
UCRL-50029-76	15	p0372	N77-25634	#	US-PATENT-APPL-SN-777983	15	p0360	N77-24340*	#
UCRL-50033-76-1	15	p0345	N77-22633	#	US-PATENT-APPL-SN-785257	15	p0363	N77-24590*	#
UCRL-50034-76-3	14	p0249	N77-21681	#	US-PATENT-APPL-SN-790637	15	p0344	N77-22615*	#
UCRL-50034-76-4	15	p0392	N77-27527	#	US-PATENT-APPL-SN-801452	16	p0513	N77-28583*	#
UCRL-50038-76-2	15	p0364	N77-24601	#	US-PATENT-APPL-SN-803823	15	p0363	N77-24593*	#
UCRL-51244	15	p0394	N77-27548	#	US-PATENT-APPL-SN-811815	16	p0513	N77-28584*	#
UCRL-51930-VOL-1	16	p0530	N77-30645	#	US-PATENT-APPL-SN-823061	16	p0529	N77-30613*	#
UCRL-51979	13	p0120	N77-14393	#	US-PATENT-APPL-SN-829319	16	p0543	N77-32435*	#
UCRL-52000-76-8	15	p0345	N77-22627	#	US-PATENT-APPL-SN-829390	16	p0535	N77-31610*	#
UCRL-52000-76-11	15	p0396	N77-27651	#	US-PATENT-APPL-SN-830382	16	p0535	N77-31611*	#

# REPORT/ACCESSION NUMBER INDEX

US-PATENT-CLASS-23-281	13	p0086	N77-10636*	UTIAS-REVIEW-40	13	p0087	N77-10644 #
US-PATENT-CLASS-48-61	13	p0086	N77-10636*	UWPDH-175	15	p0358	N77-23951 #
US-PATENT-CLASS-48-116	13	p0086	N77-10636*	VA-99-R070-2	16	p0559	N77-33670 #
US-PATENT-CLASS-48-117	13	p0086	N77-10636*	VP-X-166	15	p0363	N77-24591 #
US-PATENT-CLASS-48-197R	13	p0086	N77-10636*	VPI-SU-5103-1	14	p0225	N77-19642 #
US-PATENT-CLASS-48-212	13	p0086	N77-10636*	VTH-191	13	p0111	N77-13012 #
US-PATENT-CLASS-52-2	16	p0545	N77-32583*	WA/4578-76/1	15	p0373	N77-25647 #
US-PATENT-CLASS-52-117	16	p0545	N77-32582*	WMO-448	15	p0387	N77-27038 #
US-PATENT-CLASS-52-173	16	p0534	N77-31601*	WRI-65	15	p0368	N77-24673 #
US-PATENT-CLASS-60-39.03	15	p0353	N77-23106*	WSC-101-4	16	p0522	N77-29619 #
US-PATENT-CLASS-60-39.28R	15	p0353	N77-23106*	WSS/CI PAPER 76-25	16	p0419	N77-43593 #
US-PATENT-CLASS-60-39.66	15	p0353	N77-23106*	WSS/CI PAPER 76-53	16	p0508	N77-51611 #
US-PATENT-CLASS-60-527	13	p0104	N77-12402*	WST6-52	16	p0536	N77-31633 #
US-PATENT-CLASS-60-641	16	p0545	N77-32582*	W76-10614	13	p0126	N77-14960 #
US-PATENT-CLASS-62-4	16	p0545	N77-32581*	W77-00635	14	p0234	N77-20656 #
US-PATENT-CLASS-123-3	13	p0086	N77-10636*	W77-02079	15	p0352	N77-23022 #
US-PATENT-CLASS-123-41.33	15	p0353	N77-23106*	W77-02218	15	p0350	N77-22709 #
US-PATENT-CLASS-123-122E	15	p0353	N77-23106*	W77-03288	15	p0348	N77-22671 #
US-PATENT-CLASS-126-263	16	p0545	N77-32581*	W77-03966	15	p0354	N77-23592 #
US-PATENT-CLASS-126-270	14	p0228	N77-20401*	W77-04144	15	p0368	N77-24673 #
US-PATENT-CLASS-126-270	16	p0545	N77-32582*	W77-04145	15	p0367	N77-24634 #
US-PATENT-CLASS-126-271	14	p0228	N77-20401*	W77-08196	16	p0539	N77-31664 #
US-PATENT-CLASS-126-271	16	p0545	N77-32582*	Y-2072	15	p0388	N77-27194 #
US-PATENT-CLASS-136-89-AC	16	p0534	N77-31601*				
US-PATENT-CLASS-136-89P	16	p0534	N77-31601*				
US-PATENT-CLASS-137-101	15	p0353	N77-23106*				
US-PATENT-CLASS-165-2	16	p0545	N77-32581*				
US-PATENT-CLASS-165-1C7	16	p0545	N77-32581*				
US-PATENT-CLASS-204-157.1R	16	p0544	N77-32580*				
US-PATENT-CLASS-210-DIG.27	16	p0532	N77-31308*				
US-PATENT-CLASS-210-40	16	p0532	N77-31308*				
US-PATENT-CLASS-250-203R	14	p0228	N77-20401*				
US-PATENT-CLASS-250-527	16	p0544	N77-32580*				
US-PATENT-CLASS-252-373	13	p0086	N77-10636*				
US-PATENT-CLASS-260-2.5A	16	p0532	N77-31308*				
US-PATENT-CLASS-260-2.5AM	16	p0532	N77-31308*				
US-PATENT-CLASS-260-2.5AY	16	p0532	N77-31308*				
US-PATENT-CLASS-260-77.5AP	16	p0532	N77-31308*				
US-PATENT-CLASS-320-2	13	p0121	N77-14581*				
US-PATENT-CLASS-350-288	16	p0518	N77-28933*				
US-PATENT-CLASS-350-295	16	p0545	N77-32583*				
US-PATENT-CLASS-350-310	16	p0518	N77-28933*				
US-PATENT-CLASS-350-320	16	p0518	N77-28933*				
US-PATENT-CLASS-350-320	16	p0545	N77-32583*				
US-PATENT-CLASS-415-180	15	p0353	N77-23106*				
US-PATENT-CLASS-423-650	13	p0086	N77-10636*				
US-PATENT-CLASS-427-47	16	p0545	N77-32583*				
US-PATENT-CLASS-427-130	16	p0545	N77-32583*				
US-PATENT-CLASS-429-23	13	p0121	N77-14581*				
US-PATENT-CLASS-429-34	13	p0121	N77-14581*				
US-PATENT-CLASS-431-11	13	p0086	N77-10636*				
US-PATENT-CLASS-431-41	13	p0086	N77-10636*				
US-PATENT-CLASS-431-116	13	p0086	N77-10636*				
US-PATENT-CLASS-431-162	13	p0086	N77-10636*				
US-PATENT-CLASS-431-170	13	p0086	N77-10636*				
US-PATENT-3,982,910	13	p0086	N77-10636*				
US-PATENT-3,987,630	13	p0104	N77-12402*				
US-PATENT-3,996,064	13	p0121	N77-14581*				
US-PATENT-4,011,854	14	p0228	N77-20401*				
US-PATENT-4,020,632	15	p0353	N77-23106*				
US-PATENT-4,035,065	16	p0518	N77-28933*				
US-PATENT-4,039,489	16	p0532	N77-31308*				
US-PATENT-4,040,867	16	p0534	N77-31601*				
US-PATENT-4,044,753	16	p0545	N77-32582*				
US-PATENT-4,044,821	16	p0545	N77-32581*				
US-PATENT-4,045,315	16	p0544	N77-32580*				
US-PATENT-4,046,462	16	p0545	N77-32583*				
USAAHBDL-TR-75-56A	13	p0102	N77-12052 #				
USAPA-TR-76-15	14	p0233	N77-20612 #				
USAPESA-BT-2031	15	p0398	N77-28040 #				
USCG-D-6-77	16	p0531	N77-30841 #				
USCG-D-55-76	13	p0110	N77-12572 #				
USCG-D-80-76	14	p0209	N77-16460 #				
USCG-D-95-76	15	p0341	N77-22293 #				
USCG-D-106-76	15	p0375	N77-25672 #				
USCG-D-130-76	15	p0360	N77-24410 #				
USGS-CIRC-698	16	p0544	N77-32563 #				
USNA-EPRD-20	14	p0209	N77-16461 #				
USNA-EPRD-28	14	p0214	N77-18230 #				
UTEC-ME-76-171	15	p0380	N77-26642 #				

1 Report No NASA SP-7043 (16)	2 Government Accession No.	3 Recipient's Catalog No	
4 Title and Subtitle ENERGY A Continuing Bibliography (Issue 16)		5 Report Date January 1978	
		6 Performing Organization Code	
7 Author(s)		8 Performing Organization Report No	
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington, D.C. 20546		10 Work Unit No	
		11 Contract or Grant No	
12 Sponsoring Agency Name and Address		13 Type of Report and Period Covered	
		14 Sponsoring Agency Code	
15 Supplementary Notes			
16 Abstract  This bibliography lists 1287 reports, articles, and other documents introduced into the NASA scientific and technical information system from October 1, 1977 through December 31, 1977.			
17 Key Words (Suggested by Author(s)) Bibliographies                      Wind Energy Energy Conversion Energy Policy Solar Energy		18 Distribution Statement  Unclassified - Unlimited	
19 Security Classif (of this report) Unclassified	20 Security Classif (of this page) Unclassified	21. No. of Pages 772	22 Price* \$9.00 HC

\* For sale by the National Technical Information Service, Springfield, Virginia 22161

# **PUBLIC COLLECTIONS OF NASA DOCUMENTS**

## **DOMESTIC**

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

### **CALIFORNIA**

University of California, Berkeley

### **COLORADO**

University of Colorado, Boulder

### **DISTRICT OF COLUMBIA**

Library of Congress

### **GEORGIA**

Georgia Institute of Technology, Atlanta

### **ILLINOIS**

The John Crerar Library, Chicago

### **MASSACHUSETTS**

Massachusetts Institute of Technology, Cambridge

### **MISSOURI**

Linda Hall Library, Kansas City

### **NEW YORK**

Columbia University, New York

### **OKLAHOMA**

University of Oklahoma, Bizzell Library

### **PENNSYLVANIA**

Carnegie Library of Pittsburgh

### **WASHINGTON**

University of Washington, Seattle

NASA publications (those indicated by an "\*" following the accession number) are also received by the following public and free libraries:

### **CALIFORNIA**

Los Angeles Public Library

San Diego Public Library

### **COLORADO**

Denver Public Library

### **CONNECTICUT**

Hartford Public Library

### **MARYLAND**

Enoch Pratt Free Library, Baltimore

### **MASSACHUSETTS**

Boston Public Library

### **MICHIGAN**

Detroit Public Library

### **MINNESOTA**

Minneapolis Public Library

### **MISSOURI**

Kansas City Public Library

St. Louis Public Library

### **NEW JERSEY**

Trenton Public Library

### **NEW YORK**

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

### **OHIO**

Akron Public Library

Cincinnati Public Library

Cleveland Public Library

Dayton Public Library

Toledo Public Library

### **TENNESSEE**

Memphis Public Library

### **TEXAS**

Dallas Public Library

Fort Worth Public Library

### **WASHINGTON**

Seattle Public Library

### **WISCONSIN**

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York 10017.

## **EUROPEAN**

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "\*", from ESA - Space Documentation Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.

National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Official Business

Penalty for Private Use, \$300

SPECIAL FOURTH CLASS MAIL  
BOOK

Postage and Fees Paid  
National Aeronautics and  
Space Administration  
NASA-451



POSTMASTER

If Undeliverable (Section 158  
Postal Manual) Do Not Return

## NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP-7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

*Details on the availability of these publications may be obtained from:*

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Washington, D.C. 20546